

*The* **DUNHAM**  
**HEATING**  
**EQUIPMENT**

*Do 1175*

**C.A.DUNHAM CO. LIMITED**

**1523 DAVENPORT RD.**

**ST. JOHN'S  
HALIFAX  
QUEBEC  
SHERBROOKE**

**MONTREAL  
OTTAWA  
TORONTO  
HAMILTON**

**TORONTO**

**WINNIPEG  
CALGARY  
EDMONTON  
VANCOUVER**

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CCA



# DUNHAM code rated

## CABINET CONVECTOR RADIATORS

### TYPES FG, FIG AND WG

The Dunham Cabinet Convector Radiators, Types FG, FIG and WG, are complete heating units and include heating elements and cabinets. Front outlet dampers are provided when so ordered. Cabinets with inlet grilles (type FIG) can be furnished. The floor cabinets are designed so that they may be fully exposed or partially recessed within the wall. For partially recessed applications the wall surface of the recess should be insulated, but additional metal liners are not required. Recesses made for cabinets should have  $\frac{1}{8}$ " clearance at the sides and top of cabinets with wood moulding trim applied on face of wall around the joint of recess and cabinet.



Type FG Floor Cabinet



Type WG Wall Cabinet

### CONSTRUCTION

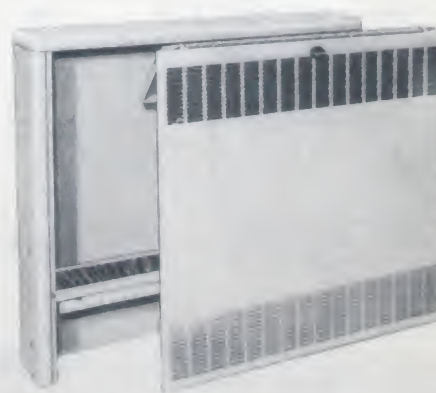
Cabinets are fabricated of sheet steel of quality and gauge which produce a product with all the physical characteristics of fine metal furniture. No bolts, screws or rivets mar the smooth exterior surfaces. Columnar forming of the sides, rounded corners and interior reinforcements produce an exceptionally rugged and rigid assembly. Cabinets are equipped with suitable supports for the heating elements to simplify installation. Dampers, when ordered, are built as an integral part of the removable front panel.

### THE REMOVABLE FRONT

Accessibility is a particularly desirable feature in convectors to simplify installation and periodic cleaning of heating element and enclosure interior. Dunham Cabinet Convectors provide accessibility by an easily removable front panel. An upward, outward and downward movement of the bottom of the panel is all that is required to free the panel. It can be replaced with equal simplicity.



**FRONT PANEL CATCH**  
 Fig. 4043  
 Facilitates ready removal  
 and replacement of the  
 front panel of Cabinet Convectors

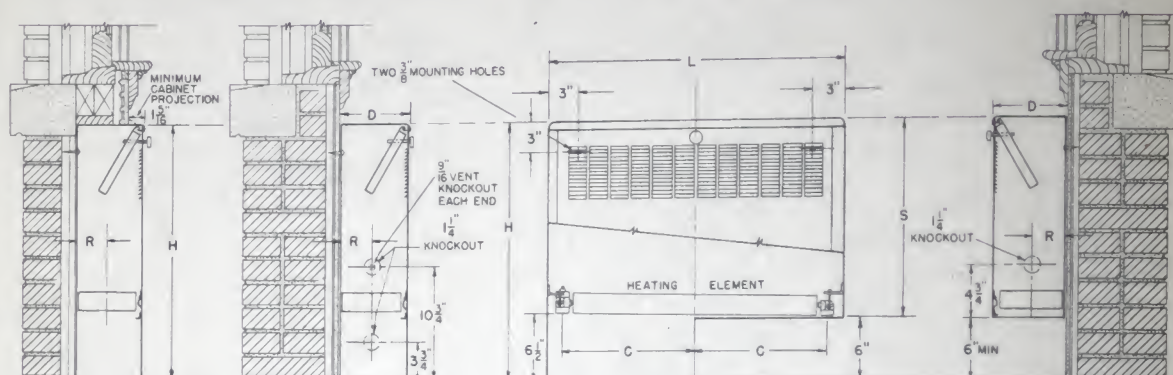


Type FIG Floor Cabinet  
 with Inlet Grille



## DIMENSIONS AND INSTALLATION DATA

### TYPES FG, FIG AND WG



Types FG, FIG  
Partially Recessed

Types FG, FIG  
Fully Exposed

Fig. 3194B

Type WG  
Fully Exposed

LENGTH													
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	64	72
"L"	Overall Length	16 <sup>3⁄8"</sup>	20 <sup>3⁄8"</sup>	24 <sup>3⁄8"</sup>	28 <sup>3⁄8"</sup>	32 <sup>3⁄8"</sup>	36 <sup>3⁄8"</sup>	40 <sup>3⁄8"</sup>	44 <sup>3⁄8"</sup>	48 <sup>3⁄8"</sup>	56 <sup>3⁄8"</sup>	64 <sup>3⁄8"</sup>	72 <sup>3⁄8"</sup>
"C"	Tapping Centres	6 <sup>1⁄4"</sup>	8 <sup>1⁄4"</sup>	10 <sup>1⁄4"</sup>	12 <sup>1⁄4"</sup>	14 <sup>1⁄4"</sup>	16 <sup>1⁄4"</sup>	18 <sup>1⁄4"</sup>	20 <sup>1⁄4"</sup>	22 <sup>1⁄4"</sup>	26 <sup>1⁄4"</sup>	30 <sup>1⁄4"</sup>	34 <sup>1⁄4"</sup>
Recess Length, FG and FIG Units = "L" plus 1⁄2" All Tappings 3⁄4".													
DEPTH													
Ordering Depth Reference		4G		6G		8G		10G					
"D"	Cabinet Depth	4 <sup>5⁄16"</sup>		6 <sup>1⁄16"</sup>		7 <sup>13⁄16"</sup>		9 <sup>9⁄16"</sup>					
"R"	Tapping Centre	2"		2 <sup>7⁄8"</sup>		3 <sup>3⁄4"</sup>		4 <sup>5⁄8"</sup>					
Maximum Recess Depth		3"		4 <sup>3⁄4"</sup>		6 <sup>1⁄2"</sup>		8 <sup>1⁄4"</sup>					
HEIGHT													
"H"	Ordering and Actual Height Types FG and FIG	20"		24"		26"		32"					
"S"	Ordering and Actual Height Type WG	14"		18"		20"		26"					
Recess Height, FG and FIG Units = "H" plus 1⁄8".													

We reserve the right to change, without notice, dimensions and specifications which will be verified on request.

### HEATING ELEMENT



The Dunham Convector uses an all-non-ferrous-alloy heating element. It is uniquely resistant to corrosion and its smooth surfaces do not encourage dust adhesion. Fins are assembled on copper tubes which are welded into bronze supply and return headers. Supply headers are tapped top and bottom, return headers bottom only. Galvanized steel strips along each side protect fins from damage during shipment and installation.



# DUNHAM code rated CABINET CONVECTOR RADIATORS

## TYPES FSG, FSIG AND WSG

The Dunham Cabinet Convector Radiators, Types FSG, FSIG and WSG, are complete heating units and include heating elements and cabinets. Front outlet dampers are provided when so ordered. Cabinets with inlet grilles (type FSIG) can be furnished. Sloping top units are intended for fully exposed installation only. They meet the desire for top outlet units. The sloping top ensures that the outlet grille will be kept free of obstructions. The wall cabinet has back and sides finished flush with the bottom of the removable front and is mounted with the bottom a minimum of 6" above the finished floor.



Type FSG Floor Cabinet



Type WSG Wall Cabinet

### CONSTRUCTION

Cabinets are fabricated of sheet steel of quality and gauge which produce a product with all the physical characteristics of fine metal furniture. No bolts, screws or rivets mar the smooth exterior surfaces. Columnar forming of the sides, rounded corners and interior reinforcements produce an exceptionally rugged and rigid assembly. Cabinets are equipped with suitable supports for the heating elements to simplify installation. Dampers, when ordered, are built as an integral part of the removable front panel.

### THE REMOVABLE FRONT

Accessibility is a particularly desirable feature in convectors to simplify installation and periodic cleaning of heating element and enclosure interior. Dunham Cabinet Convectors provide accessibility by an easily removable front panel. An upward, outward and downward movement of the bottom of the panel is all that is required to free the panel. It can be replaced with equal simplicity.



**FRONT PANEL CATCH**  
Fig. 4043  
Facilitates ready removal and replacement of the front panel of Cabinet Convectors

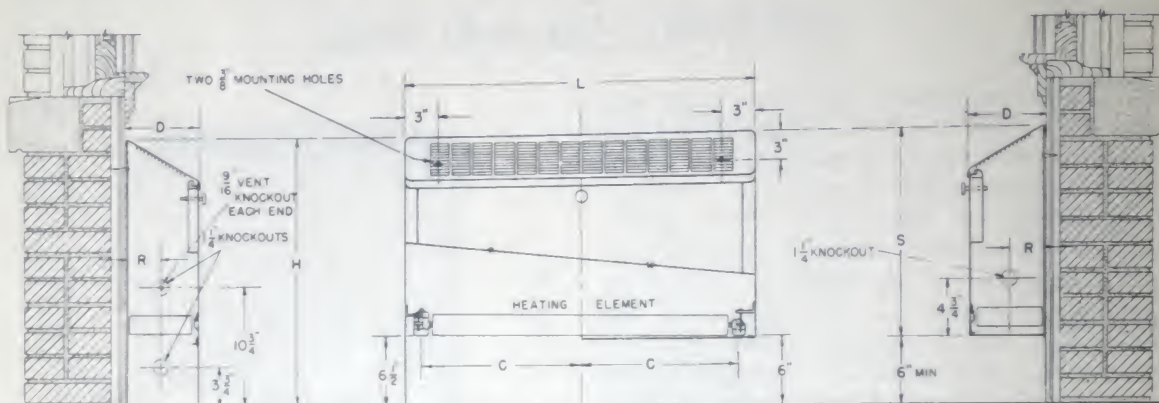


Type FSIG Floor Cabinet  
with front removed



# DIMENSIONS AND INSTALLATION DATA

## TYPES FSG, FSIG AND WSG



Types FSG, FSIG

Fig. 3195 B

Type WSG

LENGTH													
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	64	72
"L"	Overall Length	16 <sup>3</sup> / <sub>8</sub> "	20 <sup>3</sup> / <sub>8</sub> "	24 <sup>3</sup> / <sub>8</sub> "	28 <sup>3</sup> / <sub>8</sub> "	32 <sup>3</sup> / <sub>8</sub> "	36 <sup>3</sup> / <sub>8</sub> "	40 <sup>3</sup> / <sub>8</sub> "	44 <sup>3</sup> / <sub>8</sub> "	48 <sup>3</sup> / <sub>8</sub> "	56 <sup>3</sup> / <sub>8</sub> "	64 <sup>3</sup> / <sub>8</sub> "	72 <sup>3</sup> / <sub>8</sub> "
"C"	Tapping Centres	6 <sup>1</sup> / <sub>4</sub> "	8 <sup>1</sup> / <sub>4</sub> "	10 <sup>1</sup> / <sub>4</sub> "	12 <sup>1</sup> / <sub>4</sub> "	14 <sup>1</sup> / <sub>4</sub> "	16 <sup>1</sup> / <sub>4</sub> "	18 <sup>1</sup> / <sub>4</sub> "	20 <sup>1</sup> / <sub>4</sub> "	22 <sup>1</sup> / <sub>4</sub> "	26 <sup>1</sup> / <sub>4</sub> "	30 <sup>1</sup> / <sub>4</sub> "	34 <sup>1</sup> / <sub>4</sub> "
All Tappings <sup>1</sup> / <sub>4</sub> "													
DEPTH													
Ordering Depth Reference		6G						8G					
"D"	Cabinet Depth	6 <sup>1</sup> / <sub>8</sub> "						7 <sup>1</sup> / <sub>8</sub> "					
"R"	Tapping Centre	2 <sup>7</sup> / <sub>8</sub> "						3 <sup>1</sup> / <sub>4</sub> "					
HEIGHT													
"H"	Ordering and Actual Height Types FSG and FSIG	20"			24"			26"			32"		
"S"	Ordering and Actual Height Type WSG	14"			18"			20"			26"		

We reserve the right to change, without notice, dimensions and specifications which will be verified on request.

## HEATING ELEMENT



The Dunham Convactor uses an all-non-ferrous-alloy heating element. It is uniquely resistant to corrosion and its smooth surfaces do not encourage dust adhesion. Fins are assembled on copper tubes which are welded into bronze supply and return headers. Supply headers are tapped top and bottom, return headers bottom only. Galvanized steel strips along each side protect fins from damage during shipment and installation.



## TYPICAL SUPPLY AND RETURN CONNECTIONS FOR CABINET CONVECTOR RADIATORS

### TWO PIPE STEAM SYSTEMS

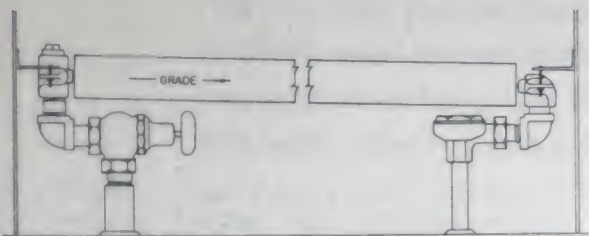


Fig. 3110C - Angle Valve for up-feed supply with Angle Trap on return

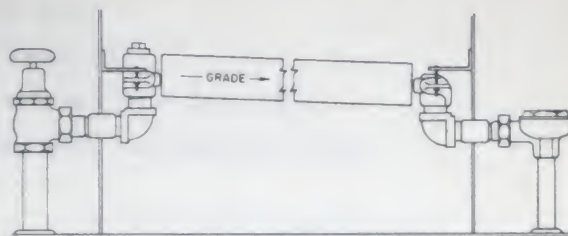


Fig. 3111C - Angle Valve for up-feed supply with Angle Trap on return (outside Cabinet)

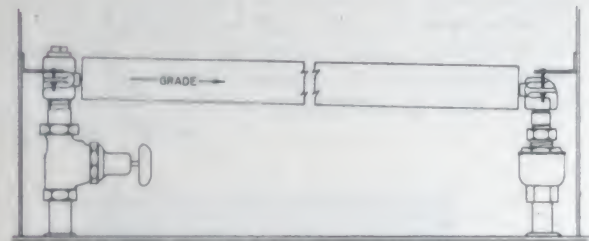


Fig. 3112C - Non-Offset Straightway Valve for up-feed supply with Vertical Trap on return

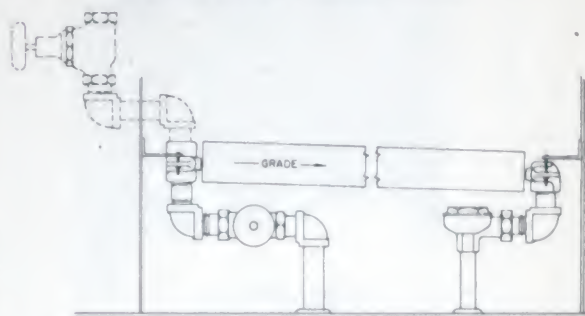


Fig. 3113C - Non-Offset Straightway Valve for up-feed or down-feed supply with Angle Trap on return

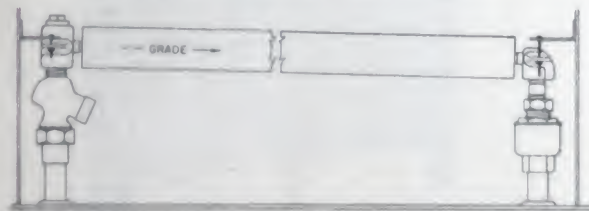


Fig. 4060 - Type 298 Non-Offset Straightway Regulating Fitting for up-feed supply with Vertical Trap on return.

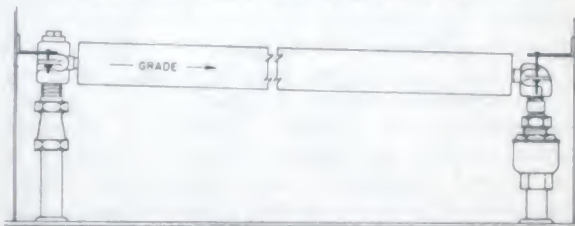


Fig. 4061 - Straightway Union Fitting for up-feed supply with Vertical Trap on return.

### HOT WATER SYSTEMS

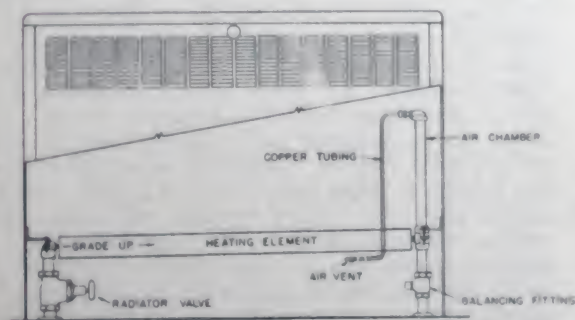


Fig. 3114C - Venting method recommended for partially and fully recessed units and Sloping Top Cabinet units

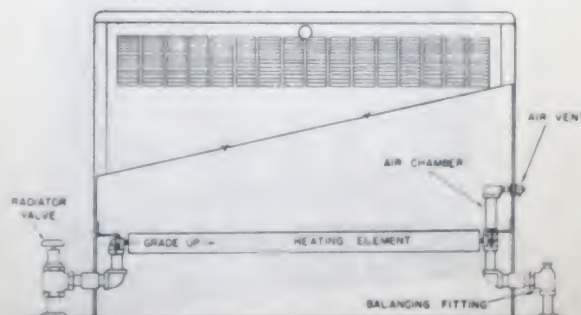


Fig. 3115C - Venting method recommended for exposed units

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drawings

Replaces File  
Dated Jan



# DUNHAM code rated METAL FRONT CONVECTOR RADIATORS

TYPE MG—Metal Front with Outlet Grille only

TYPE MIG—Metal Front with Inlet and Outlet Grille

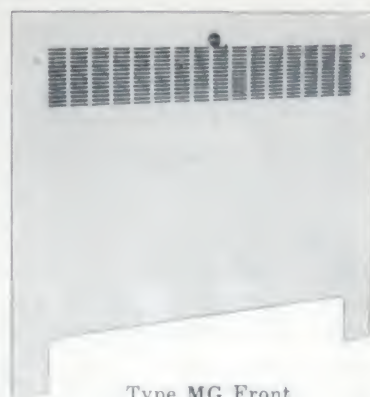
TYPE MRG—Metal Front, Outlet Grille only and Metal Recess Liner

TYPE MRIG—Metal Front, Inlet and Outlet Grille and Metal Recess Liner

The Dunham Metal Front Convector Radiators are complete heating units including heating elements, metal front panels and support angles. Outlet dampers and metal recess liners are supplied when so ordered. The enclosures are designed for fully recessed Convector application. The Metal Fronts may be made inconspicuous by painting to blend in with decoration of wall surfaces, or they may be decorated to harmonize with woodwork trim. Complete recessing allows full freedom in the arrangement of furniture and the treatment of floor coverings and drapes.



Rear View of Metal Front



Type MG Front

## CONSTRUCTION

Standard Fronts are fabricated of reinforced sheet metal steel with die-stamped grilles. Metal fronts are available for lengths of heating units and enclosure heights as shown on capacity and dimension tables. Suitable supports for the heating element are supplied to be attached to recess jambs at proper levels. Metal front panels have stiffening bevels at top and sides which provide close fit to finished wall surfaces. Dampers which provide a convenient means to adjust heat output are available when so ordered.

## APPLICATIONS

Metal Front Panels may be used wherever the thickness and available area of walls are sufficient to permit installation of the required lengths and depths of heating units. Overall recess depths should allow for weather-proofing, where required, and for insulation of the back of the recess. The installation of metal recess liners is optional. Wood framing or plaster grounds for top and sides of recess are necessary. The support angles for metal fronts are to be applied to the recess jambs by screws. Metal fronts extend  $1\frac{3}{8}$ " beyond recess opening at top and sides. Recesses for 8G and 10G Type MG and MIG Convectors require a baffle across the back of the top as indicated in dimensional drawings.

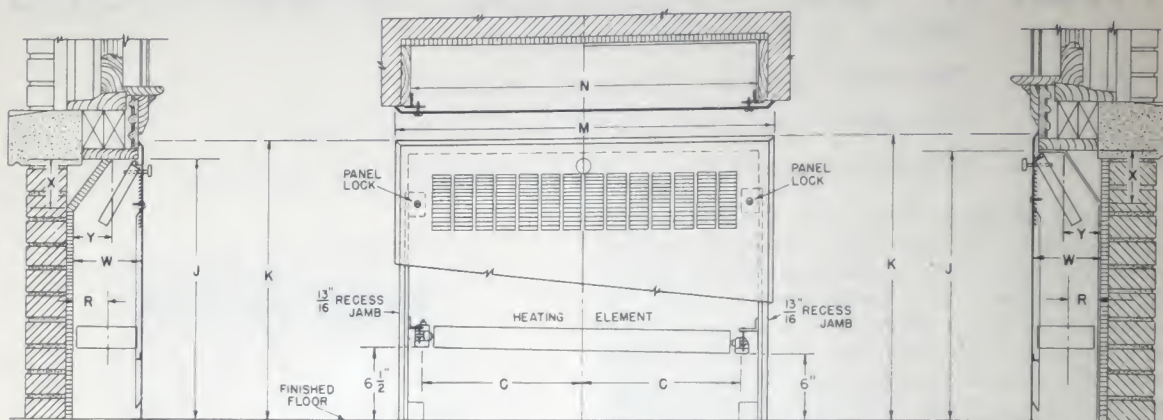


Recess showing support angles  
for Metal Front



## DIMENSIONS AND INSTALLATION DATA

### TYPES MG, MIG, MRG AND MRIG



Type MG, MIG  
(Without  
Recess Liner)

Fig. 4002 B

Type MRG, MRIG  
(With  
Recess Liner)

LENGTH													
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	64	72
"M"	Metal Front Length	19"	23"	27"	31"	35"	39"	43"	47"	51"	59"	67"	75"
"N"	Recess Length with or without Liner	16 <sup>3</sup> / <sub>8</sub> "	20 <sup>3</sup> / <sub>8</sub> "	24 <sup>3</sup> / <sub>8</sub> "	28 <sup>3</sup> / <sub>8</sub> "	32 <sup>3</sup> / <sub>8</sub> "	36 <sup>3</sup> / <sub>8</sub> "	40 <sup>3</sup> / <sub>8</sub> "	44 <sup>3</sup> / <sub>8</sub> "	48 <sup>3</sup> / <sub>8</sub> "	56 <sup>3</sup> / <sub>8</sub> "	64 <sup>3</sup> / <sub>8</sub> "	72 <sup>3</sup> / <sub>8</sub> "
"C"	Tapping Centres	6 <sup>1</sup> / <sub>4</sub> "	8 <sup>1</sup> / <sub>4</sub> "	10 <sup>1</sup> / <sub>4</sub> "	12 <sup>1</sup> / <sub>4</sub> "	14 <sup>1</sup> / <sub>4</sub> "	16 <sup>1</sup> / <sub>4</sub> "	18 <sup>1</sup> / <sub>4</sub> "	20 <sup>1</sup> / <sub>4</sub> "	22 <sup>1</sup> / <sub>4</sub> "	26 <sup>1</sup> / <sub>4</sub> "	30 <sup>1</sup> / <sub>4</sub> "	34 <sup>1</sup> / <sub>4</sub> "
All Tappings <sup>3</sup> / <sub>4</sub> ".													
DEPTH													
Ordering Depth Reference		4G		6G		8G		10G					
"W"	Recess Depth with or without Liner	3 <sup>7</sup> / <sub>8</sub> "		5 <sup>5</sup> / <sub>8</sub> "		7 <sup>3</sup> / <sub>8</sub> "		9 <sup>1</sup> / <sub>8</sub> "					
"R"	Tapping Centre	2"		2 <sup>7</sup> / <sub>8</sub> "		3 <sup>3</sup> / <sub>4</sub> "		4 <sup>5</sup> / <sub>8</sub> "					
"X"	Baffle Height	—		—		5 <sup>1</sup> / <sub>4</sub> "		7 <sup>1</sup> / <sub>4</sub> "					
"Y"	Baffle Depth	—		—		4 <sup>7</sup> / <sub>8</sub> "		7"					
HEIGHT													
Ordering Height Reference		20"		24"		26"		32"					
"K"	Metal Front Height	21 <sup>3</sup> / <sub>8</sub> "		25 <sup>3</sup> / <sub>8</sub> "		27 <sup>3</sup> / <sub>8</sub> "		33 <sup>3</sup> / <sub>8</sub> "					
"J"	Recess Height with or without Liner	20 <sup>1</sup> / <sub>8</sub> "		24 <sup>1</sup> / <sub>8</sub> "		26 <sup>1</sup> / <sub>8</sub> "		32 <sup>1</sup> / <sub>8</sub> "					

We reserve the right to change, without notice, dimensions and specifications which will be verified on request.

### HEATING ELEMENT



The Dunham Convactor uses an all-non-ferrous-alloy heating element. It is uniquely resistant to corrosion and its smooth surfaces do not encourage dust adhesion. Fins are assembled on copper tubes which are welded into bronze supply and return headers. Supply headers are tapped top and bottom, return headers bottom only. Galvanized steel strips along each side protect fins from damage during shipment and installation.

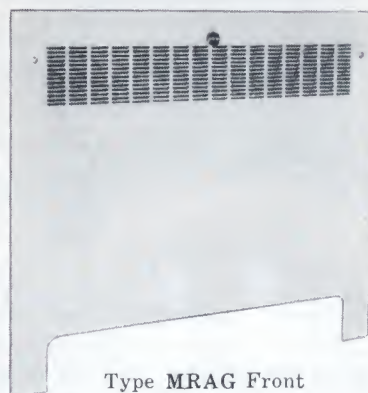


# DUNHAM code rated METAL FRONT CONVECTOR RADIATORS

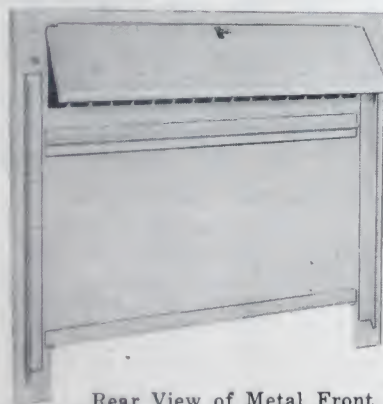
TYPE MRAG—Metal Front, Outlet Grille only, Metal Recess Liner and Angle Iron Recess Frame.

TYPE MRAIG—Metal Front, Inlet and Outlet Grille, Metal Recess Liner and Angle Iron Recess Frame.

The Dunham Metal Front Convector Radiators are complete heating units including heating elements, metal front panels and metal recess liners with angle iron recess frames. Outlet dampers are supplied when so ordered. The enclosures are designed for fully recessed convector application. The metal fronts may be made inconspicuous by painting to blend in with decoration of wall surfaces, or they may be decorated to harmonize with woodwork trim. Complete recessing allows full freedom in the arrangement of furniture and the treatment of floor coverings and drapes.



Type MRAG Front



Rear View of Metal Front

## CONSTRUCTION

Standard Fronts are fabricated of reinforced sheet metal steel with die-stamped grilles. Metal fronts are available for lengths of heating units and enclosure heights as shown on capacity and dimension tables. Suitable supports for the heating unit are attached to recess liner at proper levels to support heating element. Metal fronts have stiffening bevels at top and sides which provide close fit to finished wall surfaces. Dampers which provide a convenient means to adjust heat output are available when so ordered.

## APPLICATIONS

Metal Front Panels may be used wherever the thickness and available area of walls are sufficient to permit installation of the required lengths and depths of heating units. Overall recess depths should allow for weather-proofing, where required, and for insulation of the back of the recess. The units are intended for use in installations where wood recess framing is not used. A 1" x 1" x 1/8" angle iron frame with a 1/2" x 1/2" x 1/8" angle iron cross member is welded to the recess liner. The angle iron frame is secured to masonry wall by metal straps bent into place by masonry contractor during construction. The metal front is engaged to angle iron frame by panel locks.



Metal Recess Liner  
with Angle Iron Frame

MRG, MRIG  
(With  
Recess Liner)

64	72
67"	75"
64 3/4"	72 3/4"
30 1/4"	34 1/4"
10G	
9 1/8"	
4 3/8"	
7 1/4"	
7"	
32"	
33 3/4"	
32 1/8"	

non-ferrous-alloy  
nt to corrosion  
arage dust ad-  
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eaders. Supply  
return headers  
long each side  
pment and in-



# DIMENSIONS AND INSTALLATION DATA TYPES MRAG and MRAIG

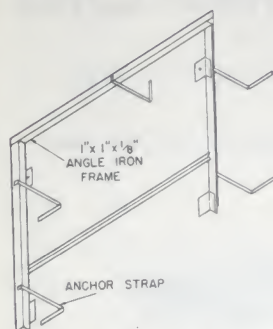


Fig. 3196 — Rear View of Angle Frame. (Recess Liner removed for clarity).

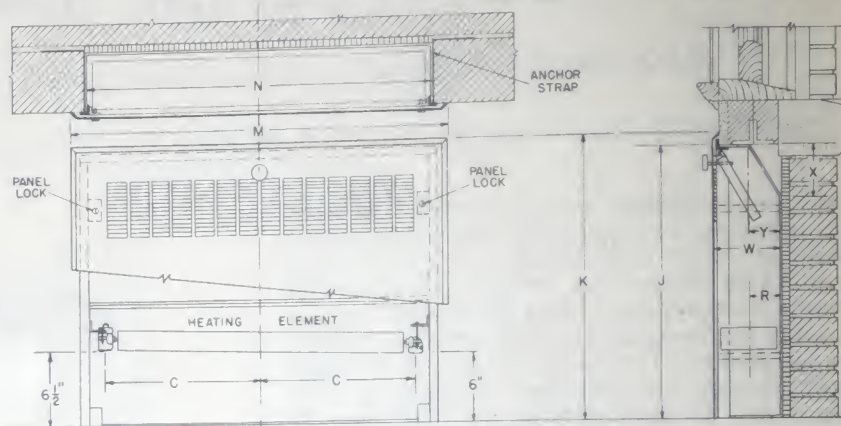


Fig. 4003B

LENGTH													
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	64	72
"M"	Metal Front Length	19"	23"	27"	31"	35"	39"	43"	47"	51"	59"	67"	75"
"N"	Recess Length	16 <sup>3⁄8</sup> "	20 <sup>3⁄8</sup> "	24 <sup>3⁄8</sup> "	28 <sup>3⁄8</sup> "	32 <sup>3⁄8</sup> "	36 <sup>3⁄8</sup> "	40 <sup>3⁄8</sup> "	44 <sup>3⁄8</sup> "	48 <sup>3⁄8</sup> "	56 <sup>3⁄8</sup> "	64 <sup>3⁄8</sup> "	72 <sup>3⁄8</sup> "
"C"	Tapping Centres	6 <sup>1⁄4</sup> "	8 <sup>1⁄4</sup> "	10 <sup>1⁄4</sup> "	12 <sup>1⁄4</sup> "	14 <sup>1⁄4</sup> "	16 <sup>1⁄4</sup> "	18 <sup>1⁄4</sup> "	20 <sup>1⁄4</sup> "	22 <sup>1⁄4</sup> "	26 <sup>1⁄4</sup> "	30 <sup>1⁄4</sup> "	34 <sup>1⁄4</sup> "
All Tappings <sup>3⁄4</sup> ".													
DEPTH													
Ordering Depth Reference		4G		6G		8G		10G					
"W"	Recess Depth	3 <sup>7⁄8</sup> "		5 <sup>5⁄8</sup> "		7 <sup>3⁄8</sup> "		9 <sup>1⁄8</sup> "					
"R"	Tapping Centre	2"		2 <sup>7⁄8</sup> "		3 <sup>3⁄4</sup> "		4 <sup>5⁄8</sup> "					
"X"	Baffle Height	—		—		5 <sup>1⁄4</sup> "		7 <sup>1⁄4</sup> "					
"Y"	Baffle Depth	—		—		4 <sup>7⁄8</sup> "		7"					
HEIGHT													
Ordering Height Reference		20"		24"		26"		32"					
"K"	Metal Front Height	21 <sup>3⁄8</sup> "		25 <sup>3⁄8</sup> "		27 <sup>3⁄8</sup> "		33 <sup>3⁄8</sup> "					
"J"	Recess Height	20 <sup>1⁄8</sup> "		24 <sup>1⁄8</sup> "		26 <sup>1⁄8</sup> "		32 <sup>1⁄8</sup> "					

We reserve the right to change, without notice, dimensions and specifications which will be verified on request.

## HEATING ELEMENT



The Dunham Convactor uses an all-non-ferrous-alloy heating element. It is uniquely resistant to corrosion and its smooth surfaces do not encourage dust adhesion. Fins are assembled on copper tubes which are welded into bronze supply and return headers. Supply headers are tapped top and bottom, return headers bottom only. Galvanized steel strips along each side protect fins from damage during shipment and installation.



# DUNHAM code rated PROJECTION FRONT CONVECTOR RADIATORS

TYPE PG—Projection Metal Front with Outlet Grille only

TYPE PIG—Projection Metal Front with Inlet and Outlet Grilles

TYPE PRG—Projection Metal Front, Outlet Grille only and Metal Recess Liner

TYPE PRIG—Projection Metal Front, Inlet and Outlet Grille and Metal Recess Liner

The Dunham Projection Metal Front enclosures provide for the partial recessing of the heating element. The portion of the heating element and enclosure projecting beyond the face of the wall is enclosed by the metal front extending beyond the limits of side jambs and head of recess, thereby eliminating the necessity of any surrounding moulding. They are made in two projection dimensions of  $2\frac{3}{4}$ " and  $4\frac{1}{4}$ ".

## APPLICATION

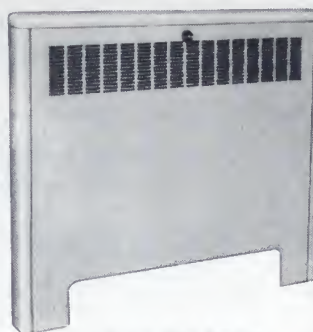
Projection Metal Fronts are applicable to both frame and masonry construction and are permanently attached to the side jambs of recess by inconspicuously located wood screws. They may be decorated to blend into wall surfaces or to harmonize with woodwork trim.

The installation of metal recess liners is optional. Recesses for Type PG and PIG Convectors for 8G and 10G Heating Units require a baffle across the back of the top as indicated in dimensional drawings.

Metal Front Panels, having a projection of  $2\frac{3}{4}$ ", may be used with 4G and 6G heating elements in frame construction using nominal 4" studs. They will be suitable for 4G, 6G and 8G heating elements in brick construction where it is permissible to recess into the wall to the width of one brick with furring, lath and plaster, also for 8G heating elements in frame construction using studs of 6" nominal width.



Type PRG with front removed



Type PG Front

Projection Metal Front having projection of  $4\frac{1}{4}$ " will be satisfactory for 8G heating elements in frame construction using 4" nominal studs and for 10G heating elements when used in brick walls where furring can be arranged to suit.

## CONSTRUCTION

The enclosures are fabricated of steel of quality and gauge making a product with all the physical characteristics of fine metal furniture. Columnar forming of the sides, rounded corners and internal reinforcements produce an exceptionally rugged and rigid assembly. Suitable metal supports are provided for installation in the recess to support the heating element. Dampers when ordered are built as an integral part of the removable front.

## THE REMOVABLE FRONT

Accessibility is a particularly desirable feature in convectors to simplify installation and periodic cleaning of heating elements and enclosure interior. Dunham projection front enclosures provide this accessibility without the need to remove the entire front enclosure. The removable front panels are easily taken out by upward and outward and downward movement of the bottom of the panel and can be replaced with equal simplicity by reversing the procedure.



### FRONT PANEL CATCH

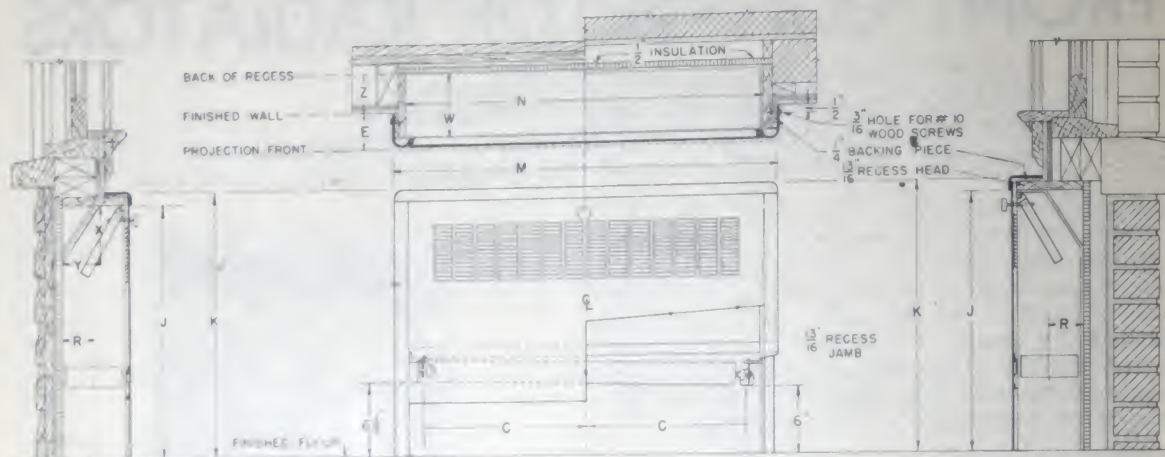
Fig. 4043

Facilitates ready removal and replacement of the front panel of Cabinet Convectors



# DIMENSIONS AND INSTALLATION DATA

## TYPES PG, PIG, PRG AND PRIG



Types PG, PIG  
(Without  
Recess Liner)

Fig. 3121C

Types PRG, PRIG  
(With  
Recess Liner)

LENGTH													
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	64	72
"M"	Projection Front Length	18 <sup>3</sup> / <sub>4</sub> "	22 <sup>3</sup> / <sub>4</sub> "	26 <sup>3</sup> / <sub>4</sub> "	30 <sup>3</sup> / <sub>4</sub> "	34 <sup>3</sup> / <sub>4</sub> "	38 <sup>3</sup> / <sub>4</sub> "	42 <sup>3</sup> / <sub>4</sub> "	46 <sup>3</sup> / <sub>4</sub> "	50 <sup>3</sup> / <sub>4</sub> "	58 <sup>3</sup> / <sub>4</sub> "	66 <sup>3</sup> / <sub>4</sub> "	74 <sup>3</sup> / <sub>4</sub> "
"N"	Recess Length with or without Liner	16 <sup>3</sup> / <sub>8</sub> "	20 <sup>3</sup> / <sub>8</sub> "	24 <sup>3</sup> / <sub>8</sub> "	28 <sup>3</sup> / <sub>8</sub> "	32 <sup>3</sup> / <sub>8</sub> "	36 <sup>3</sup> / <sub>8</sub> "	40 <sup>3</sup> / <sub>8</sub> "	44 <sup>3</sup> / <sub>8</sub> "	48 <sup>3</sup> / <sub>8</sub> "	56 <sup>3</sup> / <sub>8</sub> "	64 <sup>3</sup> / <sub>8</sub> "	72 <sup>3</sup> / <sub>8</sub> "
"C"	Tapping Centres	6 <sup>1</sup> / <sub>4</sub> "	8 <sup>1</sup> / <sub>4</sub> "	10 <sup>1</sup> / <sub>4</sub> "	12 <sup>1</sup> / <sub>4</sub> "	14 <sup>1</sup> / <sub>4</sub> "	16 <sup>1</sup> / <sub>4</sub> "	18 <sup>1</sup> / <sub>4</sub> "	20 <sup>1</sup> / <sub>4</sub> "	22 <sup>1</sup> / <sub>4</sub> "	26 <sup>1</sup> / <sub>4</sub> "	30 <sup>1</sup> / <sub>4</sub> "	34 <sup>1</sup> / <sub>4</sub> "
DEPTH													
Ordering Depth Reference		4G	6G	8G		10G							
		All Types Construction	All Types Construction	Masonry and 6" Frame Construction	Masonry and 4" Frame Construction	Masonry Construction with Furring to Suit							
"E"	Front Projection	2 <sup>1</sup> / <sub>4</sub> "	2 <sup>3</sup> / <sub>4</sub> "	2 <sup>3</sup> / <sub>4</sub> "	4 <sup>1</sup> / <sub>4</sub> "	2 <sup>3</sup> / <sub>4</sub> "	4 <sup>1</sup> / <sub>4</sub> "						
"Z"	Recess Depth—Face Finished Wall to Back of Recess with or without Liner	1 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>8</sub> "	6 <sup>1</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>8</sub> "						
"R"	Tapping Centre	2"	2 <sup>1</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>4</sub> "	4 <sup>5</sup> / <sub>8</sub> "								
"W"	Recess Depth with or without Liner	3 <sup>1</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>8</sub> "	7 <sup>3</sup> / <sub>8</sub> "	9 <sup>1</sup> / <sub>8</sub> "								
"X"	Baffle Height	—	—	5 <sup>1</sup> / <sub>4</sub> "	7 <sup>1</sup> / <sub>4</sub> "								
"Y"	Baffle Depth	—	—	4 <sup>7</sup> / <sub>8</sub> "	7"								
HEIGHT													
Ordering Height Reference		20"	24"	26"	32"								
"K"	Projection Front Height	21 <sup>1</sup> / <sub>4</sub> "	25 <sup>1</sup> / <sub>4</sub> "	27 <sup>1</sup> / <sub>4</sub> "	33 <sup>1</sup> / <sub>4</sub> "								
"J"	Recess Height with or without Liner	20 <sup>1</sup> / <sub>8</sub> "	24 <sup>1</sup> / <sub>8</sub> "	26 <sup>1</sup> / <sub>8</sub> "	32 <sup>1</sup> / <sub>8</sub> "								

We reserve the right to change, without notice, dimensions and specifications which will be verified on request.

## HEATING ELEMENT



The Dunham Convector uses an all-non-ferrous-alloy heating element. It is uniquely resistant to corrosion and its smooth surfaces do not encourage dust adhesion. Fins are assembled on copper tubes which are welded into bronze supply and return headers. Supply headers are tapped top and bottom, return headers bottom only. Galvanized steel strips along each side protect fins from damage during shipment and installation.



# APPLICATION DETAILS

## METAL FRONT CONVECTOR RADIATORS

### TYPES MG, MIG, MRG, AND MRIG

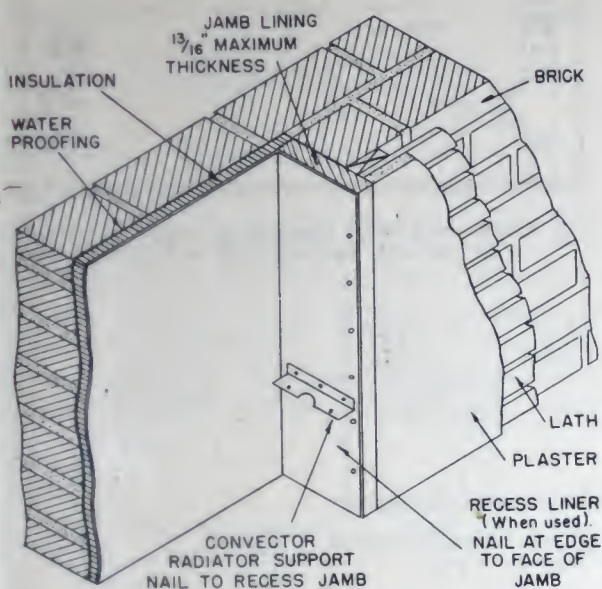


Fig. 3056B—Section through jamb of recess

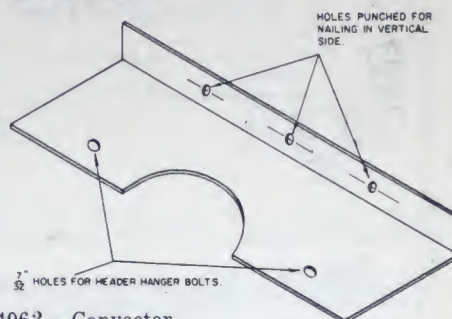


Fig. 4062—Convactor Radiator Support

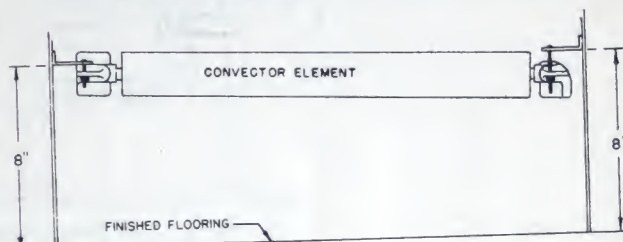


Fig. 4063

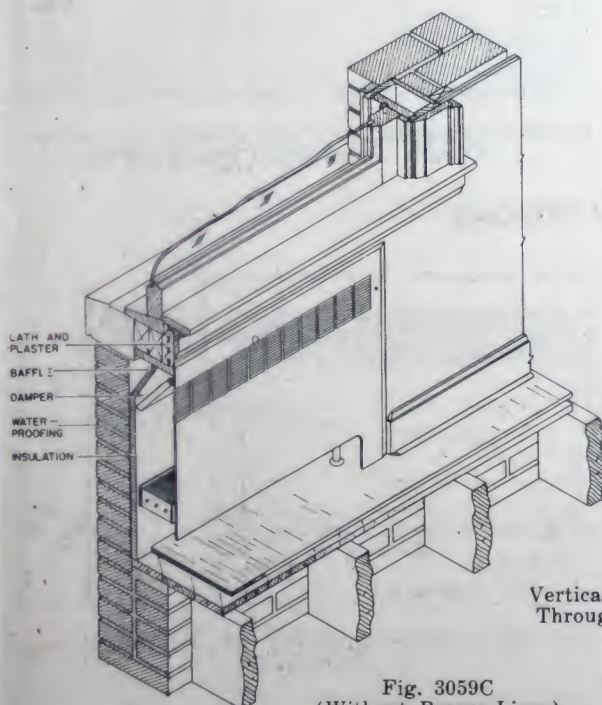


Fig. 3059C  
(Without Recess Liner)

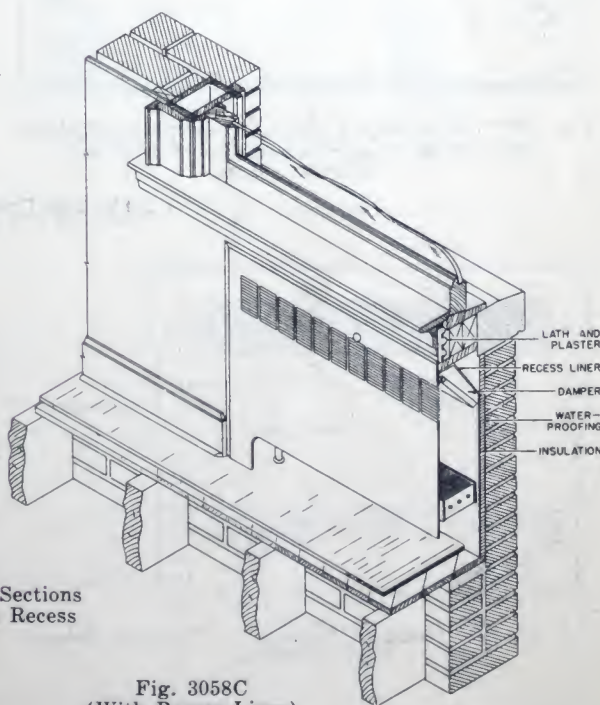


Fig. 3058C  
(With Recess Liner)

Vertical Sections  
Through Recess



## TYPICAL SUPPLY AND RETURN CONNECTIONS FOR METAL FRONT CONVECTOR RADIATORS

### TWO PIPE STEAM SYSTEMS

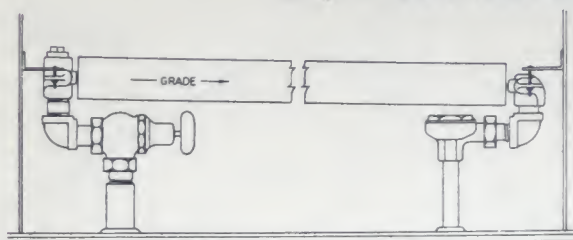


Fig. 3110C—Angle Valve for up-feed supply with Angle Trap on return

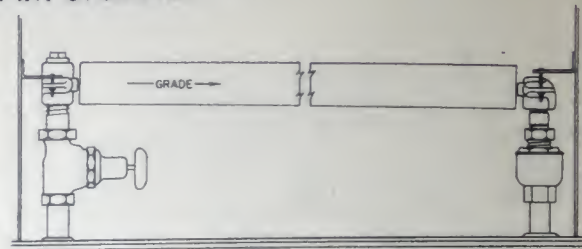


Fig. 3112C—Non-Offset Straightway Valve for up-feed supply with Vertical Trap on return

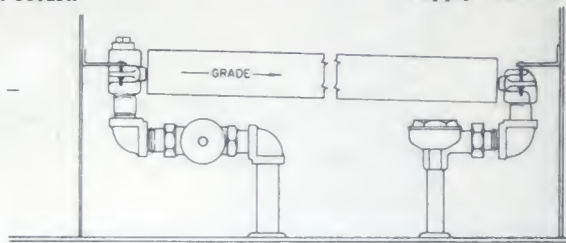


Fig. 4004A—Non-Offset Straightway Valve for up-feed supply with Angle Trap on return

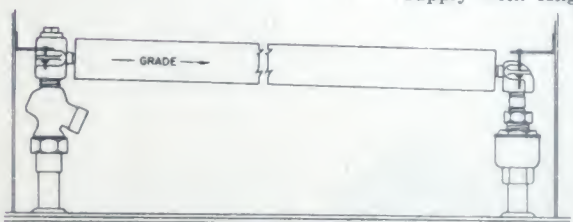


Fig. 4060—Type 298 Non-Offset Straightway Regulating Fitting for up-feed supply with Vertical Trap on return.

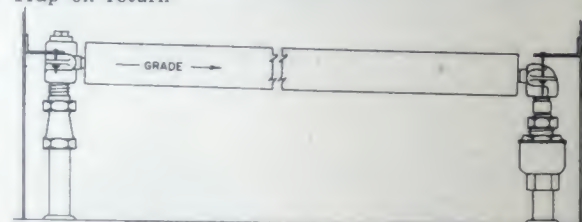


Fig. 4061—Straightway Union Fitting for up-feed supply with Vertical Trap on return.

### HOT WATER SYSTEMS

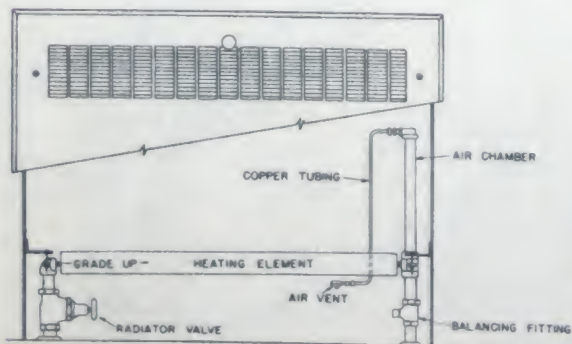


Fig. 3119C—Showing Method of Venting beneath Heating Element

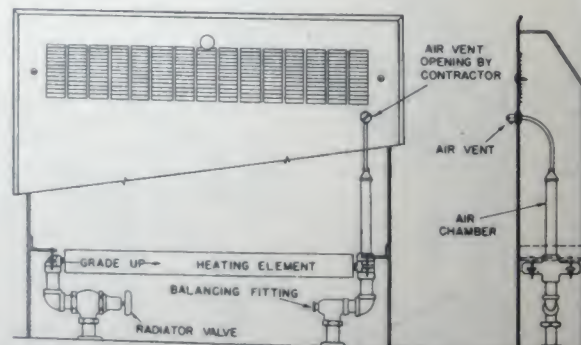


Fig. 3120C—Showing Method of Venting through Metal Front



# DUNHAM code rated CONVECTOR ELEMENTS AND GRILLES

## HEATING ELEMENT

The Dunham Convector uses an all non-ferrous-alloy heating element. It is uniquely resistant to corrosion and its smooth surfaces do not encourage dust adhesion. Fins are assembled on copper tubes which are welded into bronze supply and return headers. Supply headers are tapped top and bottom, return headers bottom only. Galvanized steel strips along each side protect fins from damage during shipment and installation.

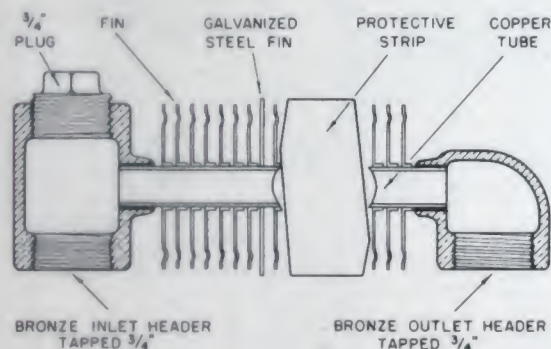


Fig. 3044C—Convector element section



Fig. 3045C

LENGTH												
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	72
"F"	Element Length	14"	18"	22"	26"	30"	34"	38"	42"	46"	54"	70"
"C"	Tapping Centres	6 $\frac{1}{4}$ "	8 $\frac{1}{4}$ "	10 $\frac{1}{4}$ "	12 $\frac{1}{4}$ "	14 $\frac{1}{4}$ "	16 $\frac{1}{4}$ "	18 $\frac{1}{4}$ "	20 $\frac{1}{4}$ "	22 $\frac{1}{4}$ "	26 $\frac{1}{4}$ "	34 $\frac{1}{4}$ "
DEPTH												
Ordering Depth Reference		4G		6G		8G		10G				
"G"	Element Depth	3 $\frac{3}{8}$ "		5 $\frac{3}{8}$ "		7 $\frac{1}{8}$ "		8 $\frac{1}{8}$ "				



## GRILLES

### FOR FRONT OUTLET CONVECTORS

The simple effective lines of this rectangular design adapt it well to any architectural scheme. The design is perforated in sheet steel. The blank margin frames the one piece unit. The grille is lined on the back with felt to prevent air leakage and wall discoloration.

All grilles and dampers are furnished standard with a prime coat of paint. Screws are not supplied. While dampers are optional they are strongly recommended (even where radiator valves are used), as a convenient method of adjusting the heat output.



The Plaster Front Type Concealed Convector is selected for dwellings because of its unobtrusiveness. The enclosure for the heating element is provided for in the building construction and the metal outlet grille is arranged for installation on plaster face as shown on Fig. 3118C. The inlet can be made through an opening cut in the baseboard to dimensions indicated in Fig. 3118C.

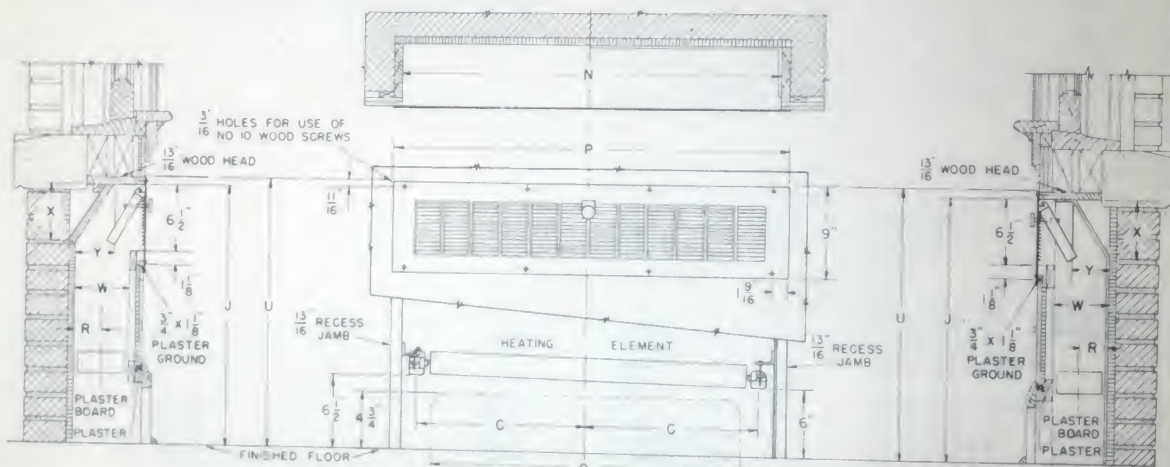


Fig. 3118C

LENGTH													
Ordering Length Reference		16	20	24	28	32	36	40	44	48	56	64	72
"P"	Grille Length	20 $\frac{1}{4}$ "	24 $\frac{1}{4}$ "	28 $\frac{1}{4}$ "	32 $\frac{1}{4}$ "	36 $\frac{1}{4}$ "	40 $\frac{1}{4}$ "	44 $\frac{1}{4}$ "	48 $\frac{1}{4}$ "	52 $\frac{1}{4}$ "	60 $\frac{1}{4}$ "	68 $\frac{1}{4}$ "	76 $\frac{1}{4}$ "
"N"	Recess Length with or without Liner	16 $\frac{3}{8}$ "	20 $\frac{3}{8}$ "	24 $\frac{3}{8}$ "	28 $\frac{3}{8}$ "	32 $\frac{3}{8}$ "	36 $\frac{3}{8}$ "	40 $\frac{3}{8}$ "	44 $\frac{3}{8}$ "	48 $\frac{3}{8}$ "	56 $\frac{3}{8}$ "	64 $\frac{3}{8}$ "	72 $\frac{3}{8}$ "
"O"	Inlet Opening Length	11"	15"	19"	23"	27"	31"	35"	39"	43"	51"	59"	67"
"C"	Tapping Centres	6 $\frac{1}{4}$ "	8 $\frac{1}{4}$ "	10 $\frac{1}{4}$ "	12 $\frac{1}{4}$ "	14 $\frac{1}{4}$ "	16 $\frac{1}{4}$ "	18 $\frac{1}{4}$ "	20 $\frac{1}{4}$ "	22 $\frac{1}{4}$ "	26 $\frac{1}{4}$ "	30 $\frac{1}{4}$ "	34 $\frac{1}{4}$ "
DEPTH													
Ordering Depth Reference		4G			6G			8G			10G		
"W"	Recess Depth with or without Liner	3 $\frac{7}{8}$ "			5 $\frac{5}{8}$ "			7 $\frac{3}{8}$ "			9 $\frac{1}{8}$ "		
"R"	Tapping Centre	2"			2 $\frac{7}{8}$ "			3 $\frac{3}{4}$ "			4 $\frac{5}{8}$ "		
"X"	Baffle Height	—			—			5 $\frac{1}{4}$ "			7 $\frac{1}{4}$ "		
"Y"	Baffle Depth	—			—			4 $\frac{7}{8}$ "			7"		
HEIGHT													
Ordering Height Reference		20"			24"			26"			32"		
"U"	Grille Height	21 $\frac{1}{32}$ "			25 $\frac{1}{32}$ "			27 $\frac{1}{32}$ "			33 $\frac{1}{32}$ "		
"J"	Recess Height with or without Liner	20 $\frac{1}{8}$ "			24 $\frac{1}{8}$ "			26 $\frac{1}{8}$ "			32 $\frac{1}{8}$ "		

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Table No

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The ratings are fully guaranteed by the company Limited and heating efficiency is guaranteed by the Bureau of

Replaces File No  
Dated: Jo



# DUNHAM CONVECTOR RADIATOR CAPACITIES — STEAM SYSTEMS

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rated

Table No. 1 FRONT OUTLET UNITS

CAPACITIES IN SQUARE FEET EDR AND MBH—BASED ON 65° ENTERING AIR TEMPERATURE AND STEAM AT 215° F. = 1 lb. ga.									
Ordering Depth Reference	Ordering Length	ORDERING HEIGHTS IN INS.—FLOOR CABINETS AND RECESSED UNITS							
		20		24		26		32	
		ORDERING HEIGHTS IN INCHES — WALL CABINETS							
		14		18		20		26	
		EDR*	Mbh†	EDR*	Mbh†	EDR*	Mbh†	EDR*	Mbh†
4G	16	8.0	1.9	9.5	2.3	9.5	2.3	10.0	2.4
	20	10.5	2.5	12.0	2.9	12.5	3.0	13.0	3.1
	24	13.0	3.1	15.0	3.6	15.5	3.7	16.0	3.8
	28	15.5	3.7	17.5	4.2	18.5	4.4	19.0	4.6
	32	18.0	4.3	20.5	4.9	21.5	5.2	22.0	5.3
	36	20.5	4.9	23.0	5.5	24.5	5.9	25.0	6.0
6G	16	12.0	2.9	13.5	3.2	14.0	3.4	15.0	3.6
	20	15.5	3.7	17.5	4.2	18.5	4.4	19.0	4.6
	24	18.5	4.4	22.0	5.3	23.0	5.5	23.5	5.6
	28	22.5	5.4	26.0	6.2	27.5	6.6	28.0	6.7
	32	26.0	6.2	30.0	7.2	31.5	7.6	33.0	7.9
	36	29.5	7.1	34.0	8.2	36.0	8.6	37.5	9.0
	40	33.0	7.9	38.0	9.1	40.0	9.6	42.0	10.1
	44	36.5	8.8	42.0	10.1	44.5	10.7	46.0	11.0
	48	40.0	9.6	46.0	11.0	49.0	11.8	51.0	12.2
	56	47.0	11.3	54.0	13.0	57.5	13.8	60.0	14.4
	64	54.0	13.0	62.0	14.9	66.5	16.0	69.0	16.6
	72	61.0	14.6	70.0	16.8	75.0	18.0	78.0	18.7
8G	28	29.0	7.0	33.0	7.9	34.0	8.2	35.0	8.4
	32	33.5	8.0	38.0	9.1	39.5	9.5	40.0	9.6
	36	38.0	9.1	43.0	10.3	45.0	10.8	46.0	11.0
	40	43.0	10.3	48.5	11.6	51.0	12.2	51.5	12.4
	44	48.0	11.5	53.5	12.8	56.0	13.4	57.0	13.7
	48	52.0	12.5	58.5	14.0	62.0	14.9	63.0	15.1
	56	62.0	14.9	69.0	16.6	73.0	17.5	74.0	17.8
	64	71.0	17.0	79.0	19.0	84.0	20.2	85.0	20.4
10G	72	80.0	19.2	89.0	21.4	95.0	22.8	96.0	23.0
	32	40.0	9.6	44.0	10.6	46.0	11.0	48.0	11.5
	36	45.0	10.8	50.0	12.0	52.0	12.5	55.0	13.2
	40	50.0	12.0	56.0	13.4	59.0	14.2	62.0	14.9
	44	56.0	13.4	62.0	14.9	65.0	15.6	69.0	16.6
	48	61.0	14.6	68.0	16.3	71.5	17.2	75.0	18.0
	56	72.0	17.3	80.5	19.3	84.0	20.2	89.0	21.4
	64	83.0	19.9	92.5	22.2	97.0	23.3	102.0	24.5
72	93.0	22.3	104.5	25.1	109.0	26.2	116.0	27.8	

\*One EDR = 240 BTU per Hour.

†Mbh—Thousands BTU per Hour.

code  
rated

## HEATING EFFECT PERCENTAGES

ORDERING HEIGHTS		Front Outlet	Sloping Top
Floor Cabinet	Wall Cabinet		
20	14	13%	4.3%
24	18	9%	3.0%
26	20	7%	2.3%
32	26	2%	.67%

The ratings of Dunham Convector Radiators are fully guaranteed by the C. A. Dunham Company Limited. They are based on condensation tests and include the following percentages for heating effects as required to conform to Commercial Standard CS 140-47 of the U.S. National Bureau of Standards.



Table No. 2

**SLOPING TOP UNITS**

CAPACITIES IN SQUARE FEET EDR AND MBH—BASED ON 65° F. ENTERING AIR TEMPERATURE AND STEAM AT 215° F. 116									
Ordering Depth Reference	Ordering Length	ORDERING HEIGHTS IN INCHES — SLOPING TOP FLOOR CABINETS							
		20		24		26		32	
		ORDERING HEIGHTS IN INCHES — SLOPING TOP WALL CABINETS							
		14		18		20		26	
		EDR*	Mbh†	EDR*	Mbh†	EDR*	Mbh†	EDR*	Mbh†
6G	16	13.5	3.2	15.0	3.6	15.5	3.7	16.5	4.0
	20	17.5	4.2	19.5	4.7	20.0	4.8	21.0	5.0
	24	22.0	5.3	24.0	5.8	24.5	5.9	26.0	6.2
	28	26.0	6.2	28.5	6.8	29.5	7.1	31.0	7.4
	32	30.0	7.2	33.0	7.9	34.5	8.3	36.0	8.6
	36	34.5	8.3	37.0	8.9	39.0	9.4	41.0	9.8
	40	38.5	9.2	42.0	10.1	44.0	10.6	45.5	10.9
	44	42.5	10.2	46.5	11.2	48.5	11.7	50.5	12.1
	48	47.5	11.4	51.5	12.4	53.5	12.9	55.5	13.3
	56	55.0	13.2	60.0	14.4	63.0	15.1	65.0	15.6
	64	63.5	15.3	69.0	16.6	72.5	17.4	75.0	18.0
72	72.0	17.3	78.5	18.9	82.0	19.7	85.0	20.4	
8G	28	31.5	7.6	34.0	8.2	35.5	8.5	36.5	8.8
	32	36.5	8.8	39.5	9.5	41.0	9.9	42.0	10.1
	36	42.0	10.1	45.0	10.8	46.5	11.2	48.0	11.5
	40	47.0	11.3	50.5	12.1	52.0	12.5	53.5	12.9
	44	52.0	12.5	55.5	13.3	57.5	13.8	59.0	14.2
	48	57.5	13.8	61.5	14.8	63.0	15.1	64.5	15.5
	56	67.0	16.1	72.0	17.3	74.0	17.8	76.0	18.3
	64	77.0	18.5	83.0	20.0	85.0	20.4	87.5	21.0
72	87.0	20.9	93.5	22.5	97.0	23.3	99.5	23.9	

\*One EDR = 240 BTU per Hour.

†Mbh—Thousands BTU per Hour.

For the convenience of designers calculating heat loss in BTU the capacity table includes Mbh values. However EDR ratings must be shown on orders.

Convectors should be designated on plans and orders by "ordering depth reference" x "ordering length" x "ordering height" and the sq. ft. EDR as 6G x 40 x 26 = 40.0 sq. ft. for all floor cabinets or recessed units and 6G x 40 x 20" = 40.0 sq. ft. for wall cabinets only.

NOTE—Overall height (ordering height) of wall cabinets is 6" less than floor cabinets.

Example: — EDR Method

Calculated EDR = 33.0

From EDR column of front outlet unit capacity table select one 6G x 36 x 24" = 34.0 sq. ft. EDR (floor cabinet) or one 6G x 40 x 20" = 33.0 sq. ft. EDR (floor cabinet)

Table No. 3 gives Conversion Factors applying to the Capacity Tables for various steam pressures and temperatures. To determine output of Convectors for

conditions other than stated in Capacity Tables, multiply EDR or Mbh values by conversion Factor in Col. No. 4, Table No. 3.

Table No. 3

Steam Pressure Lbs. per Sq. Inch	Steam Temperature ° F.	BTU Output per EDR	Factor
Col. No. 1	Col. No. 2	Col. No. 3	Col. No. 4
1	215	240	1.00
5	227	270	1.12
10	240	301	1.25
15	250	328	1.36
20	259	351	1.46
25	267	374	1.56

Example:

Rated EDR = 40.0 sq. ft.

Steam pressure = 10 lbs.

Conversion Factor from Table No. 2 — 1.25

Actual output = 40.0 x 1.25 = 50.0 sq. ft.

code rated

20°

Ordering Depth Reference

4G

6G

8G

10G

BTU per EDR

Note:

To determine Mbh values figure at 1

Example:

One 4G x 36 with 199"

Replaces File N

Dated: Jan



code  
rated

# DUNHAM CONVECTOR RADIATOR CAPACITIES — HOT WATER SYSTEMS

Table No. 1

**20° DROP FRONT OUTLET UNITS**

CAPACITIES IN MBH—THOUSANDS OF BTU PER HOUR—BASED ON 65° F. ENTERING AIR TEMPERATURE AND AVERAGE WATER TEMPERATURES LISTED BELOW																	
Ordering Depth Reference	Ordering Length	ORDERING HEIGHTS IN INCHES — FLOOR CABINETS AND RECESSED UNITS															
		20				24				26				32			
		ORDERING HEIGHTS IN INCHES — WALL CABINETS															
		14				18				20				26			
		Average Water Temperatures															
		180°	190°	200°	210°	180°	190°	200°	210°	180°	190°	200°	210°	180°	190°	200°	210°
4G	16	1.1	1.3	1.4	1.6	1.4	1.5	1.7	1.9	1.4	1.5	1.7	1.9	1.4	1.6	1.8	2.0
	20	1.5	1.7	1.9	2.1	1.7	1.9	2.2	2.4	1.8	2.0	2.2	2.5	1.8	2.1	2.3	2.6
	24	1.9	2.1	2.3	2.6	2.1	2.4	2.7	3.0	2.2	2.5	2.8	3.1	2.3	2.6	2.9	3.2
	28	2.2	2.5	2.8	3.1	2.5	2.8	3.1	3.5	2.6	3.0	3.3	3.7	2.7	3.0	3.4	3.8
	32	2.6	2.9	3.2	3.6	2.9	3.3	3.7	4.1	3.1	3.4	3.8	4.3	3.1	3.5	3.9	4.4
	36	2.9	3.3	3.7	4.1	3.3	3.7	4.1	4.5	3.5	3.9	4.4	4.9	3.6	4.0	4.5	5.0
6G	16	1.7	1.9	2.2	2.4	1.9	2.2	2.4	2.7	2.0	2.2	2.5	2.8	2.1	2.4	2.7	3.0
	20	2.2	2.5	2.8	3.1	2.5	2.8	3.1	3.5	2.6	3.0	3.3	3.7	2.7	3.0	3.4	3.8
	24	2.6	3.0	3.3	3.7	3.1	3.5	3.9	4.4	3.3	3.7	4.1	4.6	3.3	3.8	4.4	4.7
	28	3.2	3.6	4.0	4.5	3.7	4.2	4.7	5.2	3.9	4.4	4.9	5.4	4.0	4.5	5.0	5.5
	32	3.7	4.2	4.7	5.2	4.3	4.8	5.4	5.9	4.5	5.0	5.6	6.2	4.7	5.3	5.9	6.5
	36	4.2	4.7	5.3	5.8	4.8	5.4	6.1	6.7	5.1	5.8	6.4	7.1	5.3	6.0	6.7	7.4
	40	4.7	5.3	5.9	6.5	5.4	6.1	6.8	7.5	5.7	6.4	7.1	7.9	6.0	6.7	7.5	8.3
	44	5.2	5.8	6.5	7.2	6.0	6.7	7.5	8.3	6.3	7.1	8.0	8.8	6.5	7.4	8.2	9.1
	48	5.7	6.4	7.2	7.9	6.5	7.4	8.2	9.1	6.9	7.8	8.8	9.7	7.2	8.2	9.1	10.1
	56	6.7	7.5	8.4	9.3	7.7	8.6	9.7	10.7	8.2	9.3	10.3	11.4	8.5	9.6	10.7	11.9
	64	7.7	8.6	9.7	10.7	8.8	9.9	11.1	12.3	9.4	10.6	11.9	13.2	9.8	11.0	12.4	13.7
	72	8.7	9.8	10.9	12.1	9.9	11.2	12.5	13.9	10.7	12.0	13.4	14.9	11.1	12.5	14.0	15.7
8G	28	4.1	4.5	5.2	5.7	4.7	5.3	5.9	6.5	4.8	5.4	6.1	6.7	5.0	5.6	6.3	6.7
	32	4.8	5.4	6.0	6.6	5.4	6.1	6.8	7.5	5.6	6.3	7.1	7.8	5.7	6.4	7.2	7.8
	36	5.4	6.1	6.8	7.5	6.1	6.9	7.7	8.5	6.4	7.2	8.1	8.9	6.5	7.4	8.2	9.1
	40	6.1	6.9	7.7	8.5	6.9	7.8	8.7	9.6	7.2	8.2	9.1	10.1	7.3	8.2	9.2	10.2
	44	6.8	7.7	8.6	9.5	7.6	8.6	9.6	10.6	8.0	9.0	10.0	11.1	8.1	9.1	10.2	11.3
	48	7.4	8.3	9.3	10.3	8.3	9.4	10.5	11.6	8.8	9.9	11.1	12.3	9.0	10.1	11.3	12.5
	56	8.8	9.9	11.1	12.3	9.8	11.0	12.4	13.7	10.4	11.7	13.1	14.5	10.5	11.8	13.3	14.7
	64	10.1	11.4	12.7	14.1	11.2	12.6	14.1	15.7	11.9	13.5	15.1	16.6	12.1	13.6	15.2	16.9
	72	11.4	12.8	14.3	15.9	12.6	14.2	15.9	17.6	13.5	15.2	17.0	18.8	13.6	15.4	17.2	19.0
10G	32	5.7	6.4	7.2	7.9	6.3	7.0	7.9	8.7	6.5	7.4	8.2	9.1	6.7	7.7	8.6	9.5
	36	6.4	7.2	8.1	8.9	7.1	8.0	9.0	9.9	7.4	8.3	9.3	10.3	7.8	8.8	9.9	10.9
	40	7.1	8.0	9.0	9.9	8.0	9.0	10.0	11.1	8.4	9.4	10.6	11.7	8.8	9.9	11.1	12.3
	44	8.0	9.0	10.0	11.1	8.8	9.9	11.1	12.3	9.2	10.4	11.6	12.9	9.8	11.0	12.4	13.7
	48	8.7	9.8	10.9	12.1	9.7	10.9	12.2	13.5	10.2	11.4	12.8	14.2	10.7	12.0	13.4	14.9
	56	10.2	11.5	12.9	14.3	11.4	12.9	14.4	16.0	11.9	13.4	15.0	16.6	12.6	14.3	15.9	17.6
	64	11.8	13.3	14.9	16.5	13.2	14.8	16.6	18.3	13.8	15.5	17.4	19.2	14.5	16.3	18.3	20.2
	72	13.2	14.9	16.7	18.4	14.9	16.7	18.7	20.7	15.5	17.5	19.5	21.8	16.5	18.6	20.8	23.0
BTU per FDR		142	160	179	198	142	160	179	198	142	160	179	198	142	160	179	198

Note:

To determine Convector nominal EDR Rating divide Mbh values delivered by BTU per EDR listed in bold figures at the bottom of each column.

Example:

One 4G x 36 x 20" front outlet floor cabinet operating with 190° average water temperature delivers 3.8 Mbh

or 3,300 BTU per hour.

Dividing 3,300 = 20.5 Sq. Ft. EDR approximately.  
160

Note:

EDR may be read directly from steam table for convector size selected. For example 4G x 36 x 20 = 20.5 sq. ft. EDR (floor cabinet)



Table No. 2

**20° DROP SLOPING TOP UNITS**

CAPACITIES IN MBH—THOUSANDS OF BTU PER HOUR—BASED ON 65 F. ENTERING AIR TEMPERATURE AND AVERAGE WATER TEMPERATURES LISTED BELOW																		
Ordering Depth Reference	Ordering Length	ORDERING HEIGHTS IN INCHES — SLOPING TOP FLOOR CABINETS																
		20				24				26				32				
		ORDERING HEIGHTS IN INCHES — SLOPING TOP WALL CABINETS																
		14				18				20				26				
		Average Water Temperatures																
		180°	190°	200°	210°	180°	190°	200°	210°	180°	190°	200°	210°	180°	190°	200°	210°	
6G	16	1.9	2.2	2.4	2.7	2.1	2.4	2.7	3.0	2.2	2.5	2.8	3.1	2.3	2.6	3.0	3.3	
	20	2.5	2.8	3.1	3.5	2.8	3.1	3.5	3.9	2.8	3.2	3.6	4.0	3.0	3.4	3.8	4.2	
	24	3.1	3.5	3.9	4.4	3.4	3.8	4.3	4.8	3.5	3.9	4.3	4.9	3.7	4.2	4.7	5.1	
	28	3.7	4.2	4.7	5.2	4.0	4.7	5.1	5.3	4.0	4.7	5.3	5.8	4.4	5.0	5.5	6.1	
	32	4.3	4.8	5.4	5.9	4.7	5.3	5.9	6.5	4.9	5.5	6.2	6.8	5.1	5.8	6.4	7.1	
	36	4.9	5.5	6.2	6.8	5.3	5.9	6.6	7.3	5.5	6.2	7.0	7.7	5.8	6.6	7.3	8.1	
	40	5.5	6.2	6.9	7.6	6.0	6.7	7.5	8.3	6.3	7.0	7.9	8.7	6.5	7.3	8.1	9.0	
	44	6.0	6.8	7.6	8.4	6.6	7.4	8.3	9.2	6.9	7.8	8.7	9.6	7.2	8.1	9.0	10.0	
	48	6.7	7.6	8.5	9.4	7.3	8.2	9.2	10.2	7.6	8.5	9.6	10.6	7.9	8.9	9.9	11.0	
	56	7.8	8.8	9.9	10.9	8.5	9.6	10.8	11.9	8.9	10.1	11.3	12.5	9.2	10.5	11.6	12.9	
	64	9.0	10.2	11.4	12.6	9.8	11.0	12.4	13.7	10.3	11.6	13.0	14.4	10.7	12.0	13.4	14.9	
72	10.2	11.5	12.9	14.3	11.2	12.6	14.1	15.6	11.6	13.1	14.7	16.2	12.1	13.6	15.2	16.9		
8G	28	4.5	5.0	5.6	6.2	4.8	5.4	6.1	6.7	5.0	5.7	6.4	7.1	5.2	5.8	6.5	7.2	
	32	5.2	5.8	6.5	7.2	5.6	6.3	7.1	7.8	5.8	6.6	7.3	8.1	6.0	6.7	7.5	8.3	
	36	6.0	6.7	7.5	8.3	6.4	7.2	8.1	8.9	6.6	7.4	8.3	9.2	6.8	7.7	8.6	9.5	
	40	6.7	7.5	8.4	9.3	7.2	8.1	9.1	10.0	7.4	8.3	9.3	10.3	7.6	8.6	9.6	10.6	
	44	7.4	8.3	9.3	10.3	7.9	8.9	10.0	11.0	8.2	9.2	10.3	11.4	8.4	9.4	10.6	11.7	
	48	8.2	9.2	10.3	11.4	8.7	9.8	11.0	12.2	8.9	10.1	11.3	12.5	9.2	10.3	11.6	12.8	
	56	9.5	10.7	12.0	13.3	10.2	11.5	12.9	14.3	10.5	11.8	13.2	14.7	10.8	12.2	13.6	15.2	
	64	10.9	12.3	13.8	15.3	11.8	13.3	14.9	16.5	12.1	13.6	15.2	16.9	12.4	14.0	15.7	17.3	
72	12.4	13.9	15.6	17.3	13.3	15.0	16.8	18.5	13.8	15.5	17.4	19.2	14.1	15.9	17.8	19.7		
BTU per EDR		142	160	179	198	142	160	179	198	142	160	179	198	142	160	179	198	

code rated

The ratings of Dunham Convector Radiators are fully guaranteed by the C. A. Dunham Company Limited. They are based on condensation tests and include the following percentages for heating effects as required to conform to Commercial Standard CS 140-47 of the U.S. National Bureau of Standards.

ORDERING HEIGHTS		Front Outlet	Sloping Top
Floor Cabinet	Wall Cabinet		
20	14	13%	43%
24	18	9%	30%
26	20	7%	23%
32	26	2%	67%

To determine size of convector for Mechanically Circulated Hot Water Heating System first calculate Mbh required and determine average temperature of water to be circulated through convector. Then select from Capacity Table a Convector Radiator equal to or nearest to required Mbh value.

Example:

Calculated Mbh = 5.0

Average Water Temperature = 180°F

From Capacity Table for front outlet units, select one — 6G x 44 x 20 = 5.2 Mbh. (floor cabinet)

Convectors should be designated on plans by "ordering depth reference" x "ordering length" x ordering height and the capacity in Mbh or EDR.

Example — Front outlet floor and recessed units

6G x 40 x 26 = 6.4 Mbh (190°F average water temperature) or 6G x 40 x 26 = 40 sq. ft. EDR

Example — Front outlet wall cabinets only

6G x 40 x 20 = 6.4 Mbh (190°F average water temperature) or 6G x 40 x 20 = 40 sq. ft. EDR

NOTE—Overall height (ordering height) of wall cabinets is 6" less than floor cabinets.

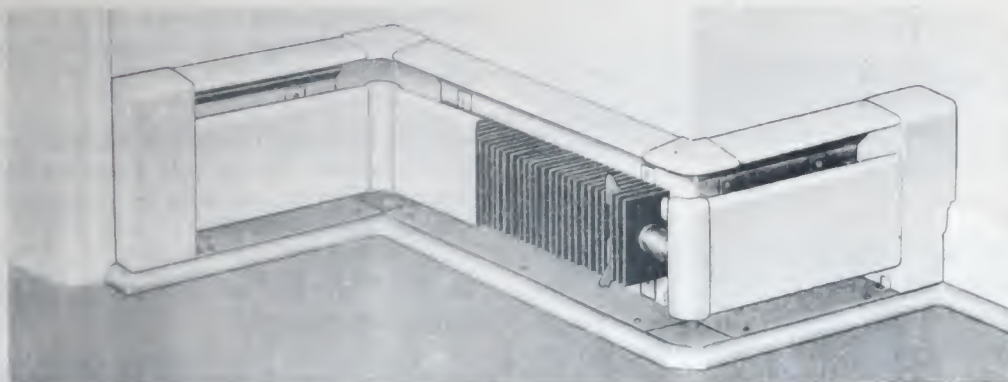
On orders capacities should be shown in Sq Ft. EDR



# DUNHAM

## BASEBOARD CONVECTOR

### TYPE BOTCS



Dunham Baseboard Convector Radiators have been developed for homes and the smaller buildings, and in keeping with modern trends, provide for the heat to be supplied near the floor of a room—the most efficient location.

The Dunham Baseboard Convector Radiator provides the following advantages:

Wider distribution of heat.

More equitable floor to ceiling temperatures and a mild radiant heat at a desirable location. Warmer inside surfaces of floors and exterior walls.

A more comfortable and effective circulation of warmed air throughout the room.

Ease and accessibility for periodic cleaning of heating element.

Air flow from Baseboard Unit while upward is also outward from wall surfaces which reduces wall discoloration to a minimum.

Replaces conventional baseboard on walls to which it is applied.

More usable floor area.

A more flexible arrangement of furniture than possible with other types of radiators.

Harmonious blending of radiator with interior decorations and furnishings.

Reduces basement piping to a minimum.

The complete Baseboard Convector Radiator includes heating element, back panel, brackets, front panel and items of trim for abutting to partitions, door frames, etc.

The Dunham Baseboard Convector Radiator Unit has an overall height of 9 $\frac{1}{4}$ " and projects 2 $\frac{1}{4}$ " from finished plaster surface. A  $\frac{3}{4}$ " x 1" plaster "ground" must be applied to furring and set with top edge 9" above finished floor. A  $\frac{3}{4}$ " "step" at the bottom of the enclosure allows for the use of wall-to-wall rugs. The edge of the rug will butt to this "step" and will thereby be flush with the line of the front panel. If wall-to-wall rugs are not used, then a "shoe strip" may be applied to the floor in front of the unit.

The Dunham Baseboard Convector Radiator Element is constructed of 2 $\frac{3}{4}$ " x 4" steel fins on a 1" copper tube which is expanded to provide a permanent and efficient bond with the fins to ensure efficient heat transmission. The outside diameter of the expanded copper tube is equal to that of standard one inch copper tubing and provides for standard solder type fittings to be used.



The Dunham Baseboard Convector Radiator Elements are available in overall lengths of 24, 36, 48, 60 and 72 inches.

The back panels and front panels are furnished in 5-foot lengths. These are used in multiple for walls longer than 5 feet and may be readily cut with a hacksaw for intermediate lengths.

The front panel is applied to and snaps directly in place on the brackets without use of screws. Splice plates are furnished to cover joints in front and back panels.

Trim units are applied to the ends of Baseboard enclosure sections at partitions and door jambs. These trim units are fastened to the back panel with screws. If the Baseboard Convector is carried around an internal or external corner, special trim units are furnished for the front and back panels.

A simple but effective damper may be installed where occasional lower temperatures are desired in certain rooms. The damper is particularly adaptable to bedrooms where a lower temperature may be required at night.

See installation section for detailed description of application.

A circulating pump must be used to distribute the water through the Baseboard Units and connecting piping.

Any conventional hot water heating boiler will be satisfactory for use with Dunham Baseboard Heating System and is to be furnished by the Heating Contractor.

Standard systems of hot water temperature controls can be used.

The connecting piping and all fittings in basement and to Baseboard Units are to be furnished by the Heating Contractor.

### DUNHAM BASEBOARD COMPONENTS



Heating Element



Baseboard Enclosure



Back Panel Splice Plate



Damper



Internal Angle Insert



Front Panel Splice Plate



Front Panel Angle Insert (Universal)



External Angle Insert



Right Hand Door Trim



Left Hand Door Trim



Right Hand Partition Trim



Left Hand Partition Trim



Trim with Access Door

Trim Unit with Access Door may be furnished in Right or Left Hand Door Trim or Partition Trim patterns.



# DUNHAM BASEBOARD CONVECTOR HEATING SYSTEM DESIGN DATA

(1) Calculate the heat loss for the space to be heated in accordance with standard practices as published by the American Society of Heating and Ventilating Engineers or other accepted authorities. This heat loss should be determined in B.T.U.'s.

(2) Select initial water temperature. This water temperature will be contingent on the wall space available for installing a sufficient number of Dunham Baseboard Heating Elements to balance the heat loss. 180°F. to 200°F. is common initial water temperature for many localities.

(3) From Table No. 1, select elements of sufficient length to provide the necessary heat output on the basis of the water temperature selected.

Example:

Residence Dining Room.

Heat required = 4065 B.T.U.'s.

Water temperature, design conditions, 190°F.

From Table No. 1, select one 48" unit and one 36" unit which supply a total of 4190 B.T.U.'s.

(4) Show on the heating plans the arrangement of heating elements. These should be placed along outside walls and concentrated under windows rather than spaced equal distances apart. However, where there is insufficient length of outside wall to accommodate all the element length required, it will be necessary to use inside partition walls.

(5) Determine the position of the various circuits taking into consideration the heating load and length of run. Allow a maximum load of 50,000 B.T.U. in any one circuit. When more than one circuit is employed, the heating loads and piping runs should be made as nearly equal as possible. This facilitates balancing after the circuits have been installed.

Piping expansion due to water temperature changes requires that straight runs of piping and elements should not exceed 20 feet. If it is necessary to use a straight run longer than 20 feet, provide for expansion by means of a loop at a partition or a loop similar to the type used to under-pass a door.

(6) To compensate for reduced output of elements for an estimated temperature drop of 20°F. within the circuit, re-estimate the length of heating elements in the circuit on the basis of Table No. 2.

Table No. 2

LOAD ON CIRCUIT	PART OF CIRCUIT LOAD	OUTPUT SELECTION BASIS
UP TO 35,000 B.T.U.	First Half of Load	Initial Water Temp.
	Last Half of Load	10° Less than Initial Water Temp.
35,000 B.T.U. TO 50,000 B.T.U.	First Third of Load	Initial Water Temp.
	Second Third of Load	10° Less than Initial Water Temp.
	Last Third of Load	20° Less than Initial Water Temp.

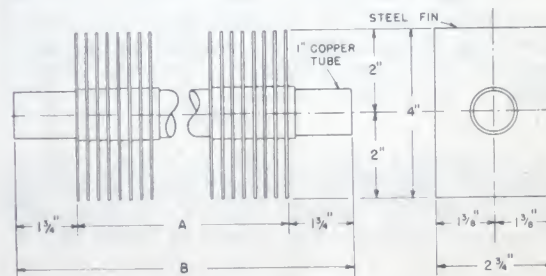


Fig. 3184A—Heating Element

Table No. 1

CAPACITY DATA DUNHAM BASEBOARD CONVECTORS										
ELEMENT NUMBER	LENGTH IN INCHES		B.T.U. PER HOUR AT 65° F ENTERING AIR							
			INITIAL WATER TEMPERATURE							STEAM TEMPERATURE
	A	B	160° F.	170° F.	180° F.	190° F.	200° F.	210° F.	220° F.	215° F.
BOTCS 24	20 1/2	24	715	850	985	1130	1270	1440	1595	1680
BOTCS 36	32 1/2	36	1120	1335	1550	1770	2000	2260	2510	2640
BOTCS 48	44 1/2	48	1530	1820	2110	2420	2720	3080	3420	3600
BOTCS 60	56 1/2	60	1940	2300	2670	3065	3445	3900	4335	4560
BOTCS 72	68 1/2	72	2350	2790	3230	3710	4170	4720	5240	5520



In selecting the elements, it should be noted that the maximum length of baseboard element that can be installed on any wall will be 12" less than the distance between adjoining walls for one element. A further reduction in maximum length of 4" must be allowed for each additional element to be installed. Thus, maximum length of one element = length of wall minus 12"; maximum length of two elements = length of wall minus 16"; maximum length of three elements = length of wall minus 20".

(7) Installations having heating loads in excess of 50,000 B.T.U.'s, will require increased pipe sizes up to the point of division into circuits. Table No. 3 indicates flow and return main sizes for various B.T.U. requirements. Flow and return risers to upper floor circuits also should be in accordance with Table No. 3.

Table No. 3

TABLE OF PIPE SIZES				
Pipe Size:	1"	1 1/4"	1 1/2"	2"
B.T.U. Capacity:	50,000	75,000	115,000	200,000

(8) Select a circulator of adequate capacity for the operating conditions. To determine the required circulator size proceed in the following manner:

(a) Calculate separately the flow of water in U.S. gallons per minute needed to supply the load for each circuit. This may be obtained by dividing the circuit heating (B.T.U.) load by 9600. (Weight of 1 U.S. gallon of water at operating temperature x assumed temperature drop of 20° x 60 minutes = 8 x 20 x 60 = 9600).

(b) Determine the length of each circuit measured from boiler through Baseboard units and connecting piping back to boilers with allowance for fittings as given in Table No. 4.

(c) Determine friction loss for each separate circuit, based on required U.S. gallons per minute and the length of circuit. Use values in 1" pipe column, Table No. 5, for friction loss.

Table No. 4

FITTING	IRON PIPE EQUIVALENT LENGTH—FEET				COPPER TUBING EQUIVALENT LENGTH—FEET			
	1" Pipe	1 1/4" Pipe	1 1/2" Pipe	2" Pipe	1" Tube	1 1/4" Tube	1 1/2" Tube	2" Tube
90° Elbow	2.08	2.61	3.12	4.17	2.08	2.61	3.12	4.17
45° Elbow	1.40	1.83	2.19	2.92	1.46	1.83	2.19	2.92
Tee — percent (100°)	3.75	4.68	5.62	7.50	3.75	4.68	5.62	7.50
side through (50°)	8.32	10.40	12.50	16.68	8.32	10.40	12.50	16.68
side (33°)	18.75	23.44	28.10	37.50	18.75	23.44	28.10	37.50
outlet (95°)	33.33	41.70	50.00	66.70	33.33	41.70	50.00	66.70
Globe Valve (open)	25.00	31.25	37.50	50.00	25.00	31.25	37.50	50.00
Gate Valve (open)	1.04	1.30	1.56	2.08	1.04	1.30	1.56	2.08
Stop Cock (open)	1.08	1.35	1.62	2.16	1.08	1.35	1.62	2.16
Boiler	0.25	0.62	0.94	1.25	0.25	0.62	0.94	1.25

Since the friction head obtained from Table No. 5 is given for 100 feet of run, the actual head will be the value determined from Table No. 5 x length of run divided by 100.

(d) Select a circulator which develops sufficient head to overcome the resistance of the circuit having the highest friction loss. The circulator must deliver the total number of gallons per minute required by all circuits against this head.

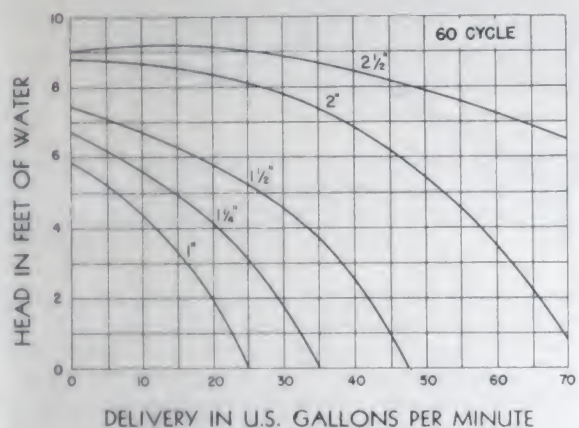
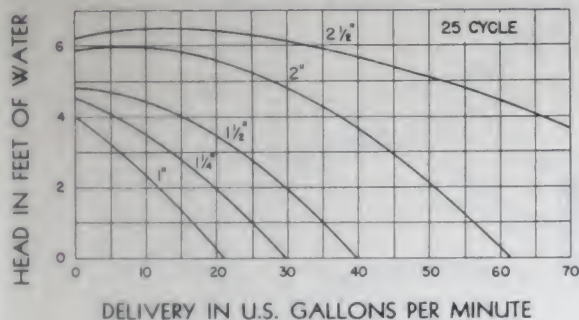
Select the size of circulator from the performance curves. These curves indicate the approximate maximum performance of circulators for a given head and discharge.

Table No. 5

FRICTION HEAD - FEET PER EQUIVALENT 100 FT. OF PIPE				
GPM	1" Pipe	1 1/4" Pipe	1 1/2" Pipe	2" Pipe
1.0	0.11	0.03	0.01	—
1.5	0.23	0.06	0.03	0.01
2.0	0.38	0.10	0.05	0.01
2.5	0.54	0.15	0.07	0.02
3.0	0.81	0.21	0.10	0.03
3.5	1.08	0.28	0.13	0.04
4.0	1.38	0.35	0.16	0.05
4.5	1.67	0.43	0.21	0.06
5.0	2.08	0.52	0.24	0.07
5.5	2.34	0.62	0.29	0.08
6.0	2.92	0.73	0.35	0.10
6.5	3.34	0.83	0.38	0.12
7.0	3.75	1.00	0.45	0.13
7.5	4.16	1.1	0.50	0.15
8.0	4.84	1.2	0.58	0.17
8.5	5.50	1.4	0.63	0.19
9.0	5.84	1.5	0.70	0.22
9.5	6.34	1.7	0.76	0.24
10	7.26	1.8	0.88	0.26
11	8.15	1.9	1.0	0.28
12	10.0	2.3	1.1	0.34
13	11.6	2.9	1.4	0.41
14	13.4	3.3	1.6	0.46
15	15.0	3.8	1.8	0.53
16	15.8	4.2	1.9	0.57
17	17.5	4.5	2.2	0.64
18	20.8	5.2	2.5	0.68
19	23.3	5.8	2.8	0.78
20	25.0	6.5	3.1	1.0
25	38.3	10.0	4.6	1.3
30	53.3	14.2	6.4	1.9
35	70.8	18.4	8.3	2.4
40	91.5	23.4	10.8	3.2
45	—	29.2	14.1	3.9
50	—	34.2	15.7	4.7



## TYPICAL CIRCULATOR PERFORMANCE CURVES—25 AND 60 CYCLE



Assuming 25 cycle current available, from performance curves for 25 cycle, select a 1 1/4" circulator.

It is recommended that selection of circulators be checked against the performance chart for the particular make of circulator to be used or specified.

(9) Select an expansion tank of adequate size from Table No. 6.

Table No. 6

TANK SIZE	CAPACITY—B.T.U.
12 x 36	150,000
12 x 48	200,000
12 x 58	250,000

(10) The net rating of the hot water heating system boiler chosen should supply the output required by the heating load + 10% for pickup load, etc. Boiler size must be increased accordingly if domestic hot water is to be supplied by indirect heater applied to the boiler.

Connections to the hot water heating system boiler include a cold water supply with stop cock or valve, a pressure relief valve and expansion tank. A flow control valve is connected into the supply main and stop cocks or gate valves, which are used to balance the system, are placed in each return circuit.

All returns pass into a common return to the circulator. A by-pass on the circulator may be used. A by-pass between circulator discharge and flow main is recommended. This by-pass must contain a balancing stop cock or gate valve. See Fig. 3185.

All equipment other than Baseboard Elements and Enclosures is to be supplied by Heating Contractor.

Example:

Circuit load = 48,000 B.T.U.'s.

G.P.M. required =  $\frac{48,000}{9,600} = 5$  G.P.M.

Circuit length = 100 feet = 100.00

5-1 1/4" Elbows = 5 x 2.61 = 13.05

11-1" Elbows = 11 x 2.08 = 22.88

1-1" Stop Cock = 1 x 2.08 = 2.08

Boiler = 10.40

148.41

From Table No. 5, for 5 G.P.M. friction head = 2.08 feet for 100 ft. run.

Total circuit friction head =  $\frac{148.41 \times 2.08}{100}$

= 3.09 feet.

Repeat for all circuits.

Assuming 3.09 feet is highest resistance of any circuit, use this value and the total load on all circuits to obtain circulator size.

Total load on all circuits = 90,000 B.T.U.'s.

G.P.M. required =  $\frac{90,000}{9,600} = 9.38$  G.P.M.

Highest friction head = 3.09 feet.

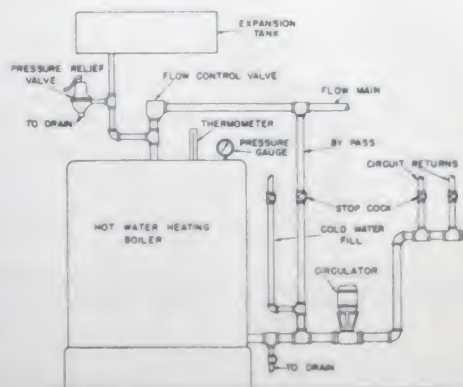


Fig. 3185—Typical Boiler Connections



# TYPICAL DUNHAM BASEBOARD INSTALLATION

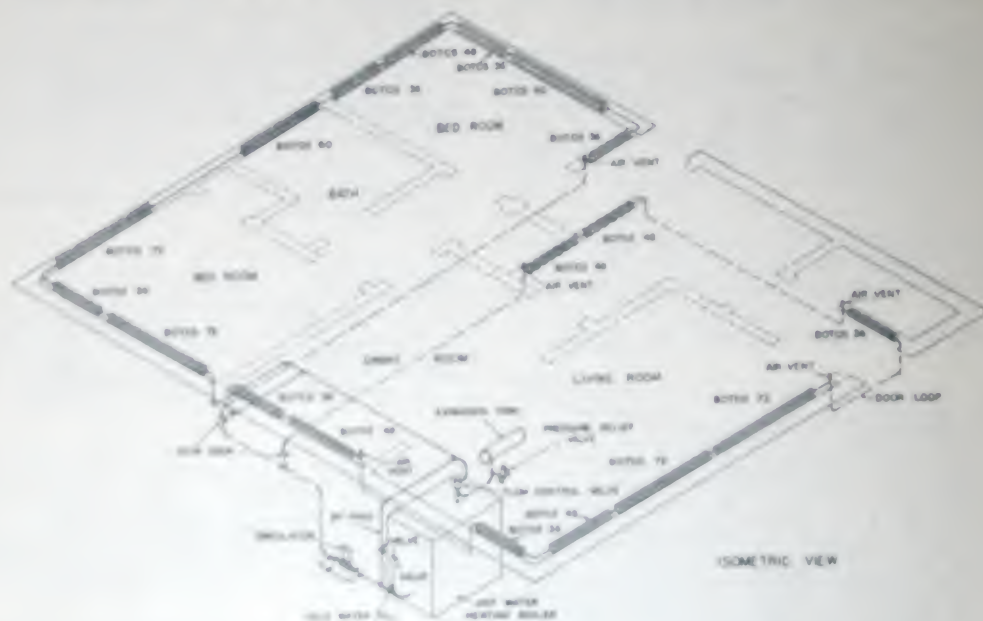


Fig. 3180 A

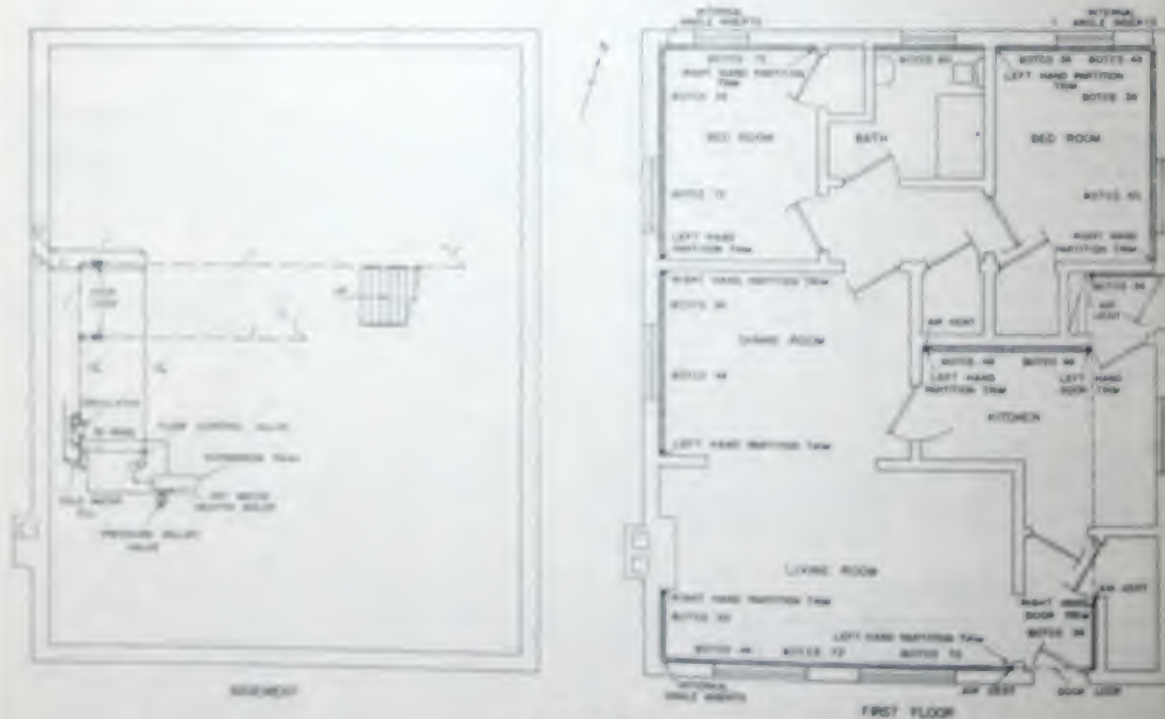
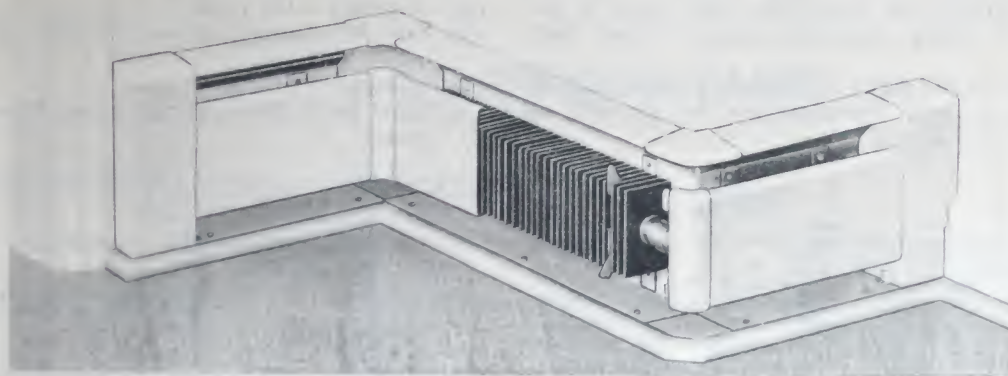


Fig. 3181 A



## DUNHAM BASEBOARD CONVECTOR INSTALLATION INSTRUCTIONS



The final appearance of the Baseboard Installation and heating results depend upon the workmanlike manner with which it is installed. Extreme care should be exercised.

- (3) The application of Baseboard to two or more walls requiring installation of external angle inserts.

The installation instruction sheets show step by step procedure for application of Dunham Baseboard units and by following these instructions, a satisfactory and workmanlike installation can be anticipated. It is strongly recommended that the entire set of instructions be read before any installation work is attempted. These instructions are presented on four separate sheets. This sheet is purely introductory and is presented to acquaint the user with the appearance of the various Baseboard components and with a few general instructions. Figs. 3188A and 3189A illustrate the overall enclosure dimensions and the location of the Baseboard components with respect to the building construction.

### GENERAL INSTRUCTIONS

To prepare for the installation of the back panel, a  $\frac{3}{4}$ " x 1" plaster "ground" shall be set with bottom of "ground" 8" from finished floor level. The plaster face must be finished flush with "ground" and not "battered" over. A  $\frac{3}{4}$ " x  $1\frac{3}{4}$ " "sill piece" shall be applied above finished floor with front face set 2-3/16" in front of finished plaster line. The back panel is to rest on this "sill piece" and shall be screwed to it and to plaster "ground". This provides for wall-to-wall carpet application. Where wall-to-wall carpet is not applied, then the conventional "shoe strip" may be used at front edge of back panel.

The other installation instruction sheets each deal with a major phase of the installation. These are 9J-5-1, page 3 & 4—Installing the back panel.

9J-5-1, page 5 & 6—Installing brackets, heating elements and dampers.

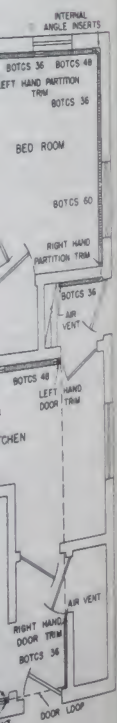
9J-5-1, page 7 & 8—Installing front panels and trim units.

- Each of the above sheets is arranged to cover
- (1) The simple installation between partitions. This applies where the Baseboard connecting piping continues through the partition.
  - (2) The application of Baseboard to two sides of a room making necessary the use of internal angle inserts.

**Note:** The "sill pieces" must terminate  $3\frac{1}{2}$ " from face of partitions or from back edge of door casings to provide space for trim units to rest on finished floor. At internal and external corners, "sill piece" should be mitered and external corner rounded to match external angle insert contour or cut at 45° angle. Insert wooden block at back of internal and external corners of "sill pieces" to provide flush finish at floor of Baseboard enclosure.

Back panels should be cut to make tight and square contact with each other and all trim pieces.

Where Baseboard is applied to two sides of a room making necessary the use of internal angle inserts, the installation should begin from this internal corner.





Care should be exercised not to bend heating elements.

When soldering joints, make sure fins line up with and are parallel to the back panel.

Maximum runs should not exceed 20 feet without provision for expansion. See page 6 for detail of typical expansion loop or door loop.

We reserve the right to change, without notice, dimensions and specifications which will be verified on request.

Tools recommended for satisfactory installation of Dunham Baseboard Convectors are:

- (1) Electric drill.
- (2) No. 31 drill for metal screws and 3/16" drill for wood screws.
- (3) Extension drill holder.
- (4) Hacksaw—12" blade.
- (5) File for cleaning ends and cuts of Baseboard sections.
- (6) Square.
- (7) Blow torch for heating copper tube solder joints.

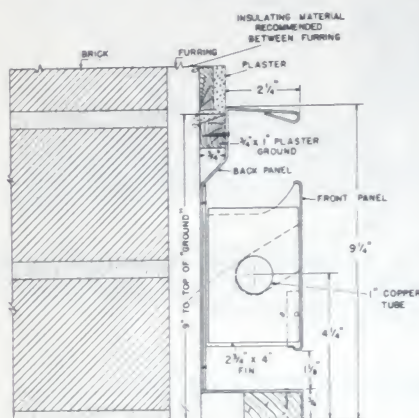


Fig. 3188A—Baseboard Unit Applied To Masonry Construction

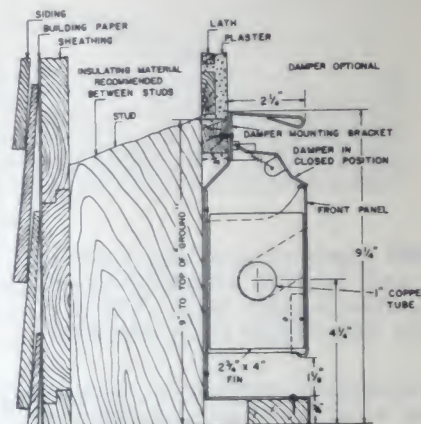


Fig. 3189A—Baseboard Unit Applied To Frame Construction

### DUNHAM BASEBOARD COMPONENTS



Heating Element



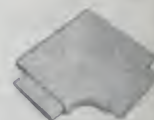
Baseboard Enclosure



Back Panel Splice Plate



Damper



Internal Angle Insert



Front Panel Splice Plate



Front Panel Angle Insert (Universal)



External Angle Insert



Right Hand Door Trim



Left Hand Door Trim



Right Hand Partition Trim



Left Hand Partition Trim



Trim with Access Door

Trim Unit with Access Door may be furnished in Right or Left Hand Door Trim or Partition Trim patterns.



# DUNHAM BASEBOARD CONVECTOR INSTALLATION INSTRUCTIONS

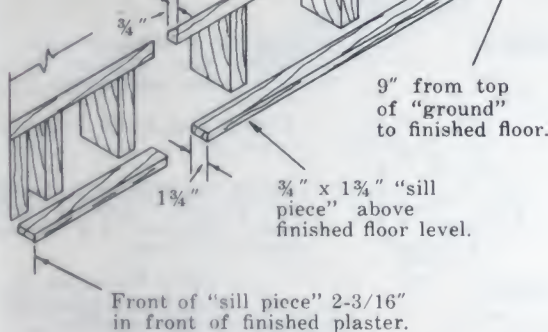
## INSTALLING THE BACK PANEL

### PARTITION TO PARTITION APPLICATION

STEP 1 Wall ready to receive back panel.

Fill space between studs or furring with insulating wallboard.

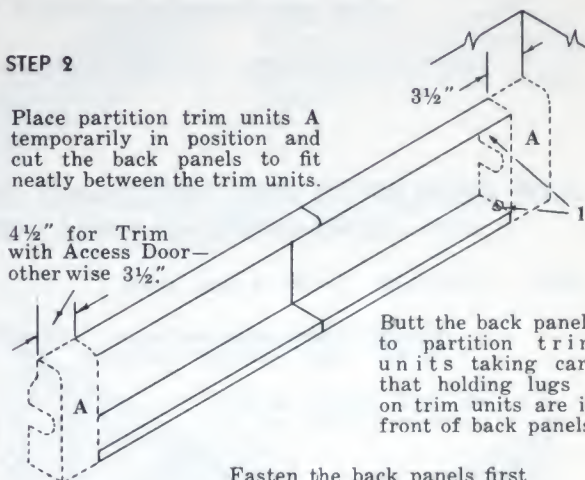
$\frac{3}{4}$ " x 1" plaster "ground" must be straight and true



STEP 2

Place partition trim units A temporarily in position and cut the back panels to fit neatly between the trim units.

$4\frac{1}{2}$ " for Trim with Access Door—otherwise  $3\frac{1}{2}$ "



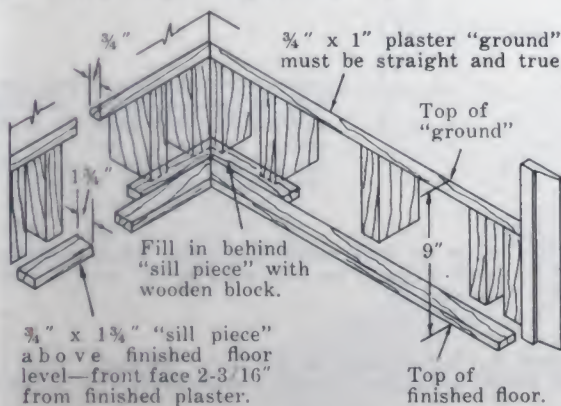
Butt the back panels to partition trim units taking care that holding lugs 1 on trim units are in front of back panels.

Fasten the back panels first to "ground", then to "sill piece" with No. 7 x  $\frac{3}{4}$ " round head wood screws.

Remove partition trim units until after piping has been installed.

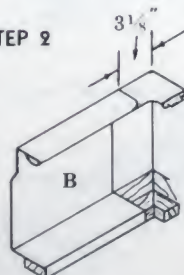
### APPLICATION TO TWO ADJOINING SIDES OF ROOM USING INTERNAL ANGLE INSERT

STEP 1 Wall ready to receive back panel.



Fill space between studs or furring with insulating wallboard.

STEP 2

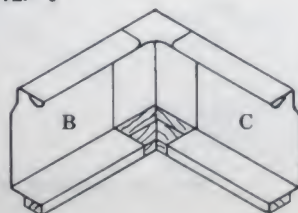


Slip lug of internal angle insert into position in fold of one back panel, B.

Then fit back panel B neatly into corner.

Fasten the back panel B first to "ground", then to "sill piece" with No. 7 x  $\frac{3}{4}$ " round head wood screws.

STEP 3

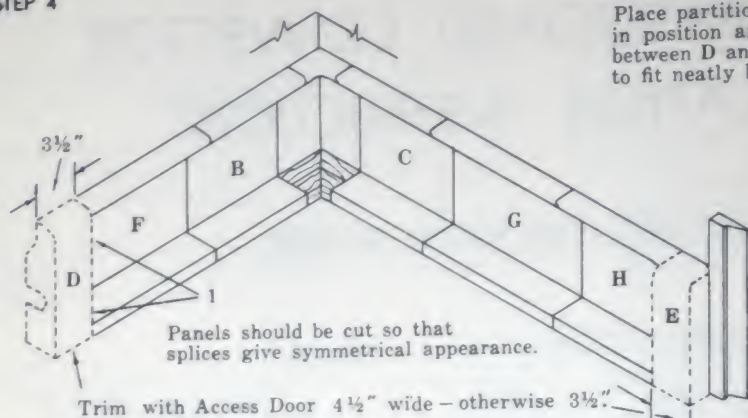


Slide adjoining back panel C into position on lug of internal angle insert.

Fasten the back panel C to wall as above.



**STEP 4**



Place partition trim D and door trim E temporarily in position and cut the back panel F to fit neatly between D and B. Also cut the back panels G and H to fit neatly between C and E.

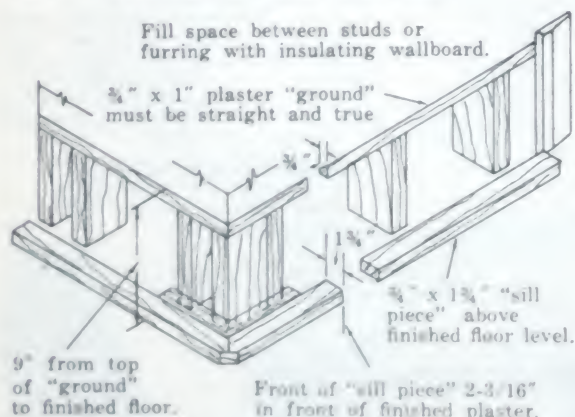
Place the back panels in position taking care that holding lugs 1 on trim units are in front of the back panels.

Fasten the back panels F, G, H, to "ground", then to "sill piece" with No. 7 x 3/4" round head screws.

Remove partition and door trim unit until after piping has been installed

**APPLICATION TO TWO ADJOINING SIDES OF ROOM  
USING EXTERNAL ANGLE INSERT**

**STEP 1** Wall ready to receive back panel.



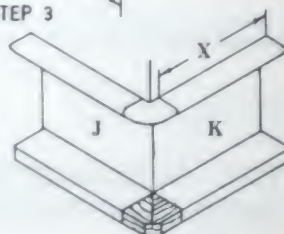
**STEP 2**

Slip lug of external angle insert into position in fold of one back panel J.

Then fit back panel J tightly to corner.

Fasten the back panel J first to "ground", then to "sill piece" with No. 7 x 3/4" round head wood screws.

**STEP 3**

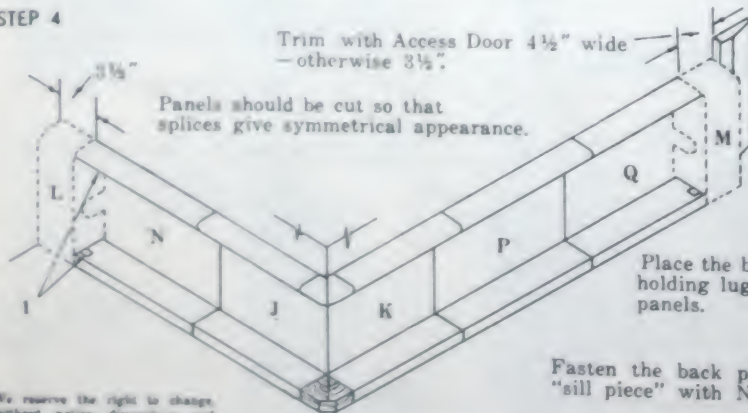


**NOTE:** Dimension X must not exceed 4'-10 1/4" to line up joints.

Slide adjoining back panel K into position on lug of external angle insert.

Fasten the back panel K to wall as above.

**STEP 4**



Place partition trim L and door trim M temporarily in position and cut the back panel N to fit neatly between L and J. Also cut the back panels P and Q to fit neatly between K and M.

Place the back panels in position taking care that holding lugs 1 on trim units are in front of back panels.

Fasten the back panels N, P, Q, to "ground", then to "sill piece" with No. 7 x 3/4" round head wood screws.

Remove partition and door trim units until after piping has been installed

We reserve the right to change without notice dimensions and specifications which will be verified on request.



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HEATING MEANS  
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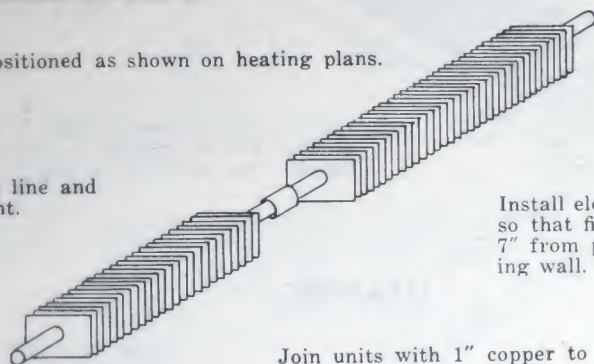
# DUNHAM BASEBOARD CONVECTOR INSTALLATION INSTRUCTIONS

## INSTALLING BRACKETS AND ELEMENTS

### STEP 1 Make up first section of elements.

Elements must be positioned as shown on heating plans.

Elements must be in line and tubes must be straight.



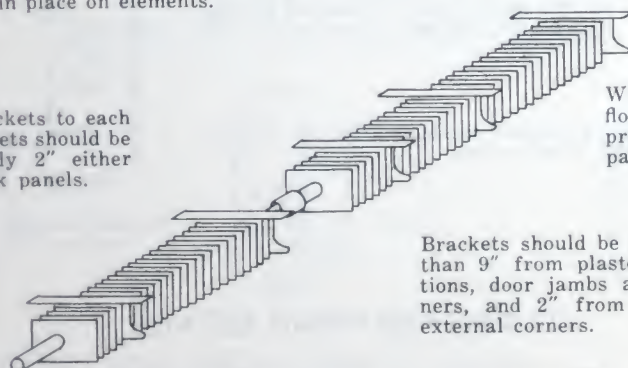
Starting at an internal corner of room, make up elements and connecting piping to a length that can be handled conveniently.

Install elements at internal corners so that first fin is not closer than 7" from plaster surface of adjoining wall.

Join units with 1" copper to copper couplings.

### STEP 2 Put brackets in place on elements.

Generally use 3 brackets to each 5 foot section. Brackets should be placed approximately 2" either side of joint of back panels.

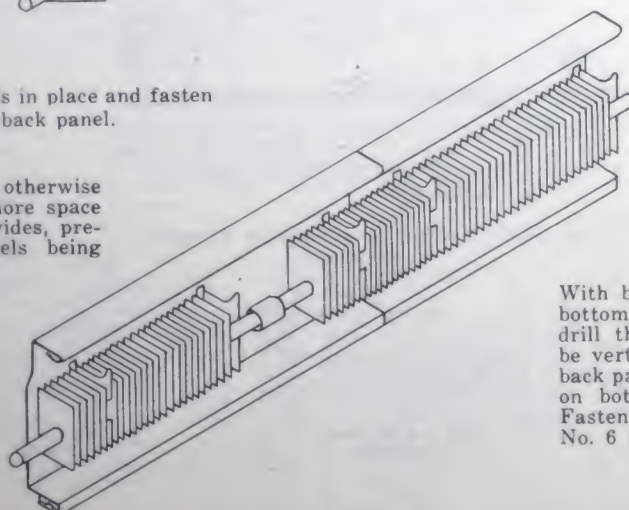


With elements on their sides on floor, position the brackets in proper relation to the back panels as shown in STEP 3.

Brackets should be placed not closer than 9" from plaster face at partitions, door jambs and internal corners, and 2" from plaster face at external corners.

### STEP 3 Put elements in place and fasten brackets to back panel.

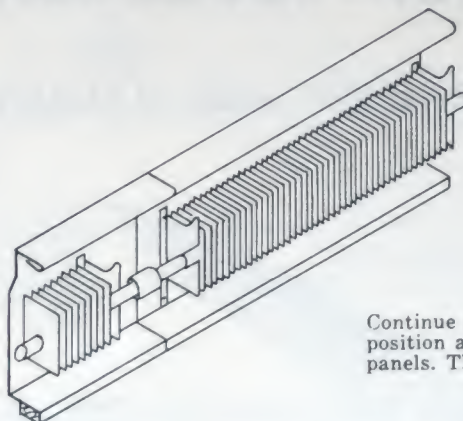
Fins must line up; otherwise elements take up more space than enclosure provides, preventing front panels being placed.



With bracket in position, drill the bottom hole with No. 31 drill. Then drill the top hole. Brackets must be vertical (90° to bottom edge of back panel) and must seat properly on bottom flange of back panel. Fasten brackets to back panel with No. 6 x 1/2" sheet metal screws.

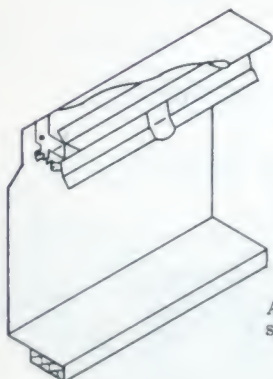


- STEP 4** Repeat STEP 1 with next length of elements.
- STEP 5** Repeat STEP 2 with next length of elements.
- STEP 6** Put elements in place and fasten brackets to back panel.



Slide elements into position in coupling on end of element previously mounted, then position brackets and fasten these to back panel as in STEP 3.

Continue this procedure until all elements are in position and all brackets are fastened to the back panels. Then solder all tubing joints.



### DAMPERS

To install damper, hold damper mounting bracket tightly against upper inside corner Y. Drill the back panels to suit screw holes in damper bracket using a No. 31 drill.

Attach damper assembly with No. 6 x 1/2" sheet metal screws.



Damper in open position



Damper in closed position

### BASEBOARD PIPING DETAILS

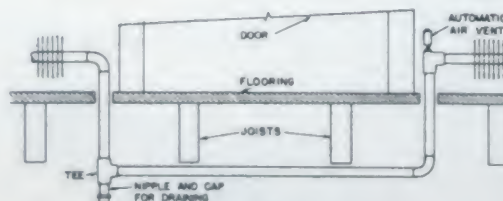


Fig. 3191—Typical Door Loop or Expansion Loop Detail

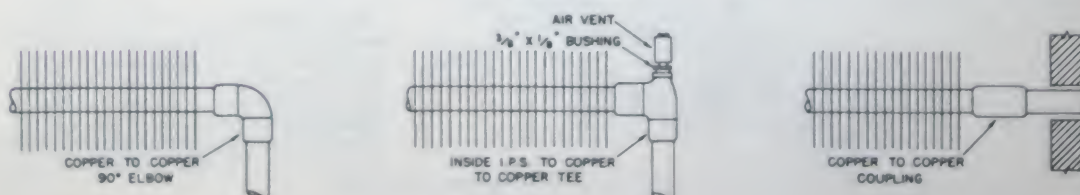


Fig. 3193A

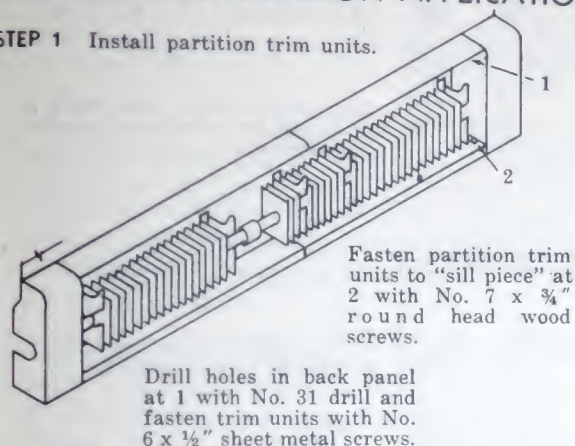


# DUNHAM BASEBOARD CONVECTOR INSTALLATION INSTRUCTIONS

## INSTALLING FRONT PANELS AND TRIM UNITS

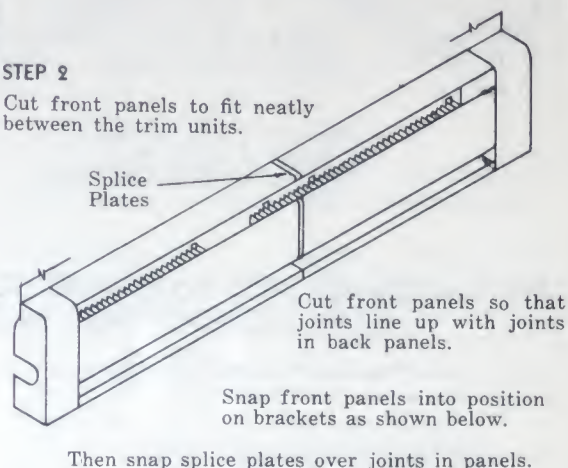
### PARTITION TO PARTITION APPLICATION

STEP 1 Install partition trim units.

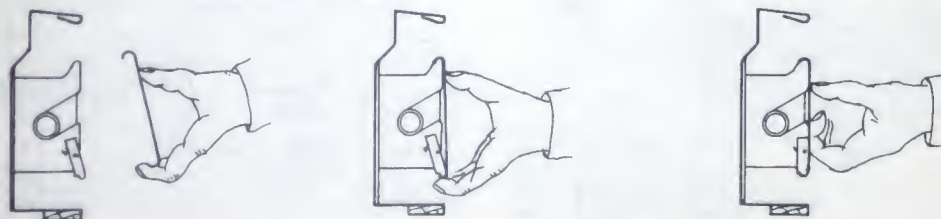


STEP 2

Cut front panels to fit neatly between the trim units.



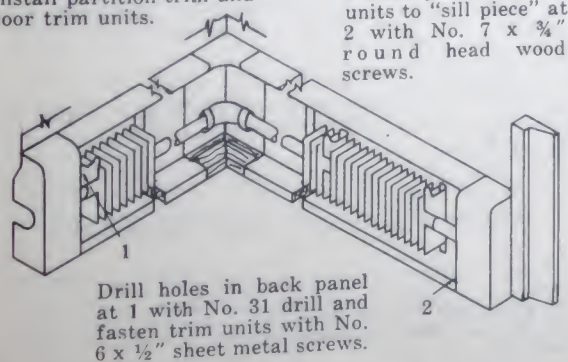
### METHOD OF ATTACHING FRONT PANELS



### APPLICATION TO TWO ADJOINING SIDES OF ROOM USING INTERNAL ANGLE INSERT

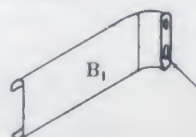
STEP 1

Install partition trim and door trim units.



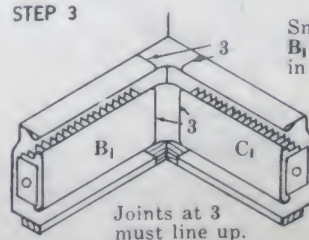
STEP 2

Slip lug of front panel angle insert into position in fold of front panel B<sub>1</sub>.



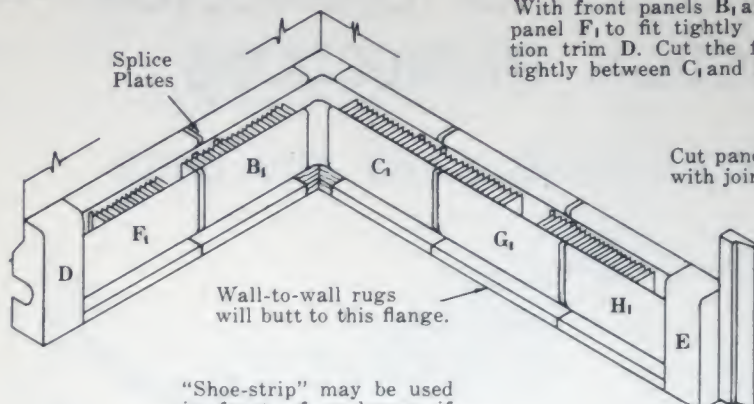
STEP 3

Snap front panel B<sub>1</sub> into position in corner.





**STEP 4**



With front panels B<sub>1</sub> and C<sub>1</sub> in place, cut the front panel F<sub>1</sub> to fit tightly between panel B<sub>1</sub> and partition trim D. Cut the front panels G<sub>1</sub> and H<sub>1</sub> to fit tightly between C<sub>1</sub> and E.

Cut panels so that joints will line up with joints in back panels.

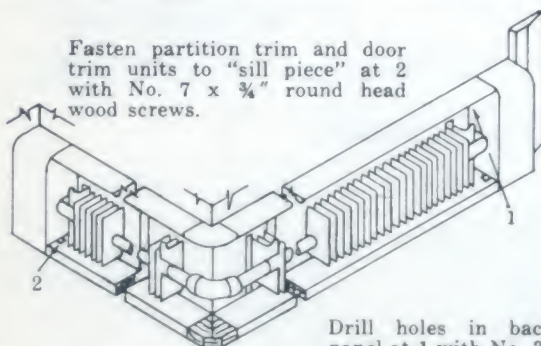
Snap front panels into position on brackets.

"Shoe-strip" may be used in front of enclosure if wall-to-wall rugs are not used.

Snap splice plates over joints in front and back panels to complete installation.

**APPLICATION TO TWO ADJOINING SIDES OF ROOM  
 USING EXTERNAL ANGLE INSERT**

**STEP 1** Install partition trim and door trim units.



Drill holes in back panel at 1 with No. 31 drill and fasten trim units with No. 6 x 1/2" sheet metal screws.

**STEP 2** Slip lug of front panel angle insert into position in fold of front panel K<sub>1</sub>.

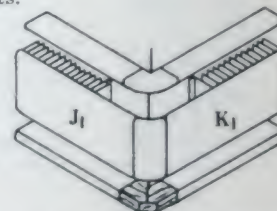
Lug with flat at bottom must be in this position.

Front panels J<sub>1</sub>, K<sub>1</sub>, must be 1 3/4" longer than back panels J, K, to line up joints.

**STEP 3**

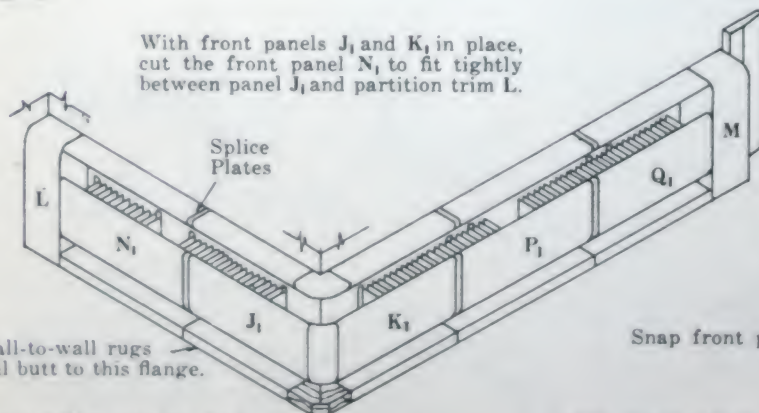
Snap panel K<sub>1</sub> into position at corner.

Snap adjoining panel J<sub>1</sub> into position on brackets.



Care must be taken to have brackets at corners line up for height or angle inserts and panels J<sub>1</sub> and K<sub>1</sub> may not produce a neat fit.

**STEP 4**



With front panels J<sub>1</sub> and K<sub>1</sub> in place, cut the front panel N<sub>1</sub> to fit tightly between panel J<sub>1</sub> and partition trim L.

Cut front panels so that joints will line up with joints in back panels.

Cut the front panels P<sub>1</sub> and Q<sub>1</sub> to fit tightly between K<sub>1</sub> and M.

Snap front panels into position on brackets.

"Shoe-strip" may be used in front of enclosure if wall-to-wall rugs are not used.

Snap splice plates over joints in front and back panels to complete installation.



## DUNHAM FIN VECTOR RADIATOR TYPE OTCS AND OTCA

FOR INSTALLATION AS INDIVIDUAL UNITS OR IN CONTINUOUS RUNS

Dunham Fin-Vector Radiators can be used on steam or mechanically circulated hot water heating systems and are designed for use in offices, schools, factories, showrooms and institutions. They may be installed as individual units or in continuous runs with or without enclosures or expanded metal covers.

It is recommended that they be installed with enclosures or covers when placed under windows or at working levels. In monitors and skylights, however, they may be installed without enclosures with a reduction in heat output. ( See table of capacities ).

The units may be installed in continuous runs connected together with solder type couplings for copper piping or with copper to iron pipe adapters for standard 1 inch steel pipe in continuous lengths up to 60 feet for 2 pound operating pressure using a steam trap and separate steam supply or up to 100 feet with 3 pound or higher operating pressure. Provision should be made for expansion and contraction of piping and where runs exceed 75 feet roller type hangers should be used to support connecting piping. The units should be installed with a grade of 1/2 inch in 10 feet in direction of condensate flow.

### Construction

**Heating Elements:** - Consist of 4" x 3 1/2" steel or aluminum fins with formed collars mounted on copper tube. The tube is expanded to give maximum heat transfer from tube to fins and is suitable for use with 1" solder fittings. Heating elements are supplied in overall lengths of 24" to 72" in 6" increments. Fins are spaced 48 to the foot and end 1-1/4" from each end of tube to permit installation of solder fittings. Elements weight 6 pounds maximum per lineal foot.

Element brackets are free to move with expansion and contraction. Two brackets are required with each element. Where

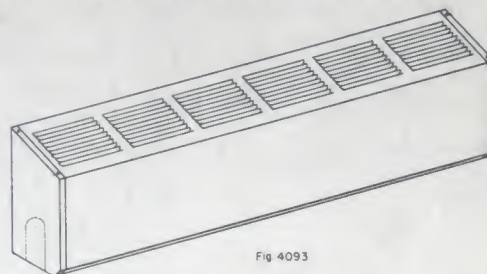


Fig 4093

possible, these should be mounted on the solder fittings at ends of elements.

**Enclosures:** - Comprise the cover, mounting strip and end plates. The cover is constructed with sloping top and louvre type outlet grille. Bottom of the enclosure is entirely open to permit free air flow over the heating element. Covers are available in lengths of 30" to 78" in 6" increments. End plates are 1" wide and are supplied with knockouts. Overall lengths of complete individual enclosures are therefore 32", 38", 44", 50", 56", 62", 68", 74" and 80". Back strips are normally supplied in 72" lengths and are cut on the job to suit. They are fastened to masonry walls with lag screws and expansion shields and to frame walls by wood screws into studs.

For continuous application of Fin-Vector enclosures to adjoining walls, 90° and 270° Elbows are available. Cover strips 6" wide are available to "fill out" long runs on wall-to-wall installations. They fit over the offset at the left end of Sloping Top Enclosures.

Wall mounted cover braces serve to support the bottom of Sloping Top Enclosures and are installed at each cover joint.

Enclosures and trim pieces are painted with metal primer. Enclosures weigh 3-1/2 pounds per lineal foot.

**Expanded Metal Covers:** - Made of 1/2" diamond mesh, 18 gauge steel reinforced at the ends. These covers are available in lengths of 24" to 72" in 6" increments.



## CAPACITIES

CAPACITIES PER LINEAL FOOT 65°F. ENTERING AIR AND STEAM TEMP. 215°F.				
UNIT	STEEL FIN OTCS		ALUM. FIN OTCA	
	BTU	EDR	BTU	EDR
WITHOUT COVER	1200	5.0	1380	5.8
SLOPING TOP COVER	1560	6.5	1800	7.5
EXPANDED METAL COVER	1165	4.9	1340	5.6

## CORRECTION FACTORS FOR STEAM AND HOT WATER

A	B							
WATER IN HG TEMP °F		80	75	70	65	60	55	50
22.4	150	3.14	2.83	2.57	2.35	2.15	1.98	1.84
20.3	160	2.57	2.35	2.15	1.98	1.84	1.71	1.59
17.7	170	2.15	1.98	1.84	1.71	1.59	1.49	1.40
14.6	180	1.84	1.71	1.59	1.49	1.40	1.32	1.24
10.9	190	1.59	1.49	1.40	1.32	1.24	1.17	1.11
6.5	200	1.40	1.32	1.24	1.17	1.11	1.05	1.00
P.S.I.								
1	215	1.17	1.108	1.053	1.000	.952	.900	.866
5	227	1.03	.980	.933	.891	.851	.814	.781
15	249	.837	.800	.767	.736	.707	.680	.655
25	267	.718	.690	.663	.639	.615	.594	.575
50	298	.570	.551	.534	.516	.500	.485	.470

## DIMENSIONS

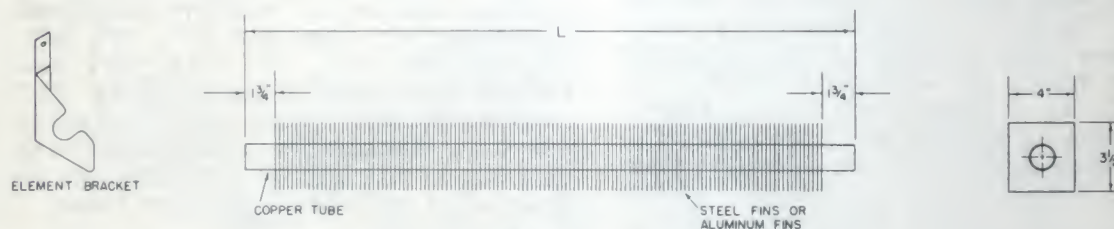
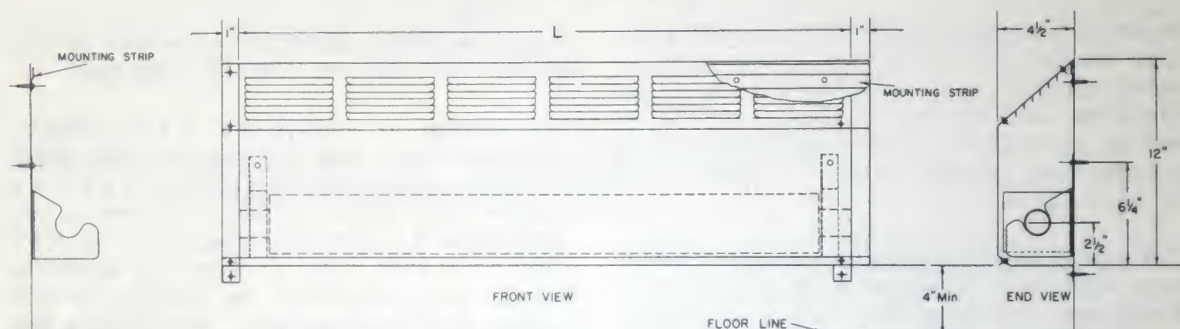


Fig. 4091



Fig. 4020A EXPANDED METAL COVER



OVERALL ELEMENT LENGTH - L = 24", 30", 36", 42", 48", 54", 60", 66", 72"

COVER LENGTH - L = 30", 36", 42", 48", 54", 60", 66", 72", 78"

WHEN VALVE AND TRAP ARE TO BE CONCEALED ON SINGLE CABINET APPLICATION, USE COVER 6" LONGER THAN ELEMENT.

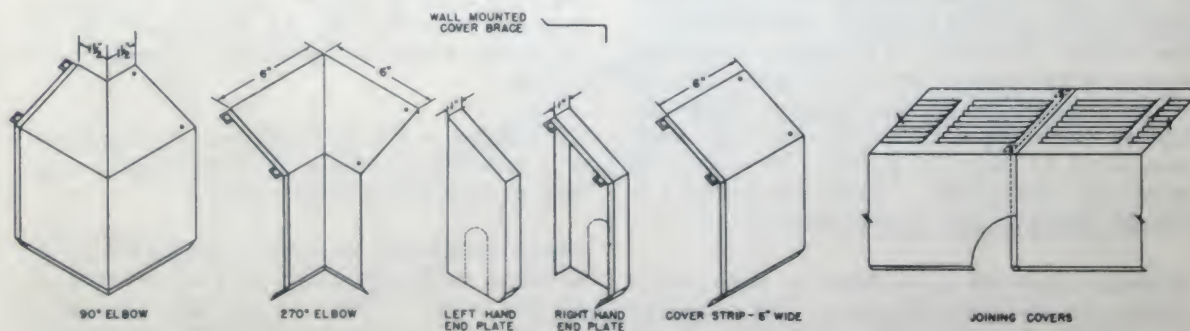


Fig. 4092



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